AD A023422

(12)

Technical Report-- Part II *December 1975*

THE DEVELOPMENT OF A TRANSPORTATION DEMONSTRATION PROJECT IN A MILITARY COMMUNITY

Part II--The Transportation Action Program for Tidewater Virginia

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APR 22 1976
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SRI Project 3935

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(11) Dec[redacted]75

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(6) THE DEVELOPMENT OF A TRANSPORTATION DEMONSTRATION PROJECT IN A MILITARY COMMUNITY.

Part II. THE TRANSPORTATION ACTION PROGRAM FOR TIDEWATER VIRGINIA.

(12) 84 p.

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(9) Technical rept. Jan - Dec 75,

Prepared for:

Director, Fleet Analysis
and Support Division
Office of Naval Research
800 North Quincy Street
Arlington, Virginia 22217

(15) N00014-75-C-0568

Ref: Contract No. N00014-[redacted]5-C-0568
364-157/12-10-74(230)

(16) NR-364-157,
SRI-3935

SRI Project 3935

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I INTRODUCTION

The following actions are recommended for consideration in Tidewater, Virginia. The Action Program is designed purposely to be flexible so as to accommodate evolving needs. The plan makes no attempt to provide complete information in any one category, nor to assign a priority to one action against another. Rather, the intent of the Action Program is to represent the collective ideas of the Navy community and to describe each in enough detail to stimulate further development for cooperative action. A summary of the recommendation actions by mode category is presented in Table 1.

A brief background is provided for each action described, along with the recommendations for action, the responsible lead agency, the proposed funding source, a preliminary estimate of cost, and the recommended timing for implementation.

Table 1

SUMMARY OF RECOMMENDED ACTIONS BY MODE CATEGORY

Mode Category	Recommended Actions
1) Automobile	Survey of on-base travel, Car pool program, Park & ride lots, and Auto disincentives;
2) Paratransit	Taxi service marketing, Fixed route taxi service, Leased vans, Private haulers association, and Auto rapid transit;
3) Buses	Public buses (Routing, amenities, Navy buses marketing, incentives);
4) Water Transportation	Passenger ferry service; feasibility study;
5) Other Transportation	Bicycles & motorbikes on-base, and feasibility of Automated guideway transit; feasibility study
and (6) Nontransit	Flexible work hours, Navy family housing, Trans-Hampton Roads crossing study, Transit Information Center, Transit marketing program. and Navy transportation task & function

II AUTOMOBILE

A. Existing Situation

Use of the automobile by Navy employees falls into two categories: (a) autos used in the daily commute situation, and (b) autos used for official business.

1. Navy Commuters

Results tabulated from a Navy-conducted survey (September 1974) show 47,548 daily commuters driving alone to Navy installations in the Tidewater, Virginia, area; 12,487 Navy commuters carpooling; and 6,810 riding public transit (Table 4, page 10).

In the United States, transportation consumes 54% of petroleum, and automobiles are the major consumer (59%) within the transportation sector. Autos average 45 to 53 seat miles per gallon, while city buses average 67 to 525 and commuter trains 40 to 240 seat miles per gallon. Thus, a fully loaded passenger car--let alone a car with only the driver--usually wastes substantially more fuel than either a half-empty train or bus.

Each working day, 33,000 persons commute in 22,000 vehicles to the Sewells Point Naval Complex. These vehicles consume an estimated 44,000 gallons of gasoline, and 16,500 of them carry only the driver. If the number of vehicles used in commuting to the base could be halved by carpooling or busing for transportation, 22,000 gallons daily, or 5,720,000 gallons annually, could be saved. Expressed in tank truck loads, that saving is 715 tank trucks of gasoline annually.

The Navy, like other government agencies and private industries, is trying to reduce pollution and conserve energy. In February of 1975, the Navy issued a formal directive to encourage carpooling to reduce gasoline consumption. In response to official Navy directives concerning the energy crisis, Commander Naval Base Norfolk initiated an extensive computerized car pool-matching survey covering 50,000 names. Close-in reserved parking on-base also was provided for carpoolers. Car pool posters and signs were displayed in buildings and at main gates. Staff personnel were assigned the responsibility of collecting data and distributing matched car pool lists at several of the bases. Additional incentives, such as express car pool and bus lanes at main gates, are in the planning stage and proposed to be initiated at Gates 4, 2, and 3A at Sewells Point later in 1975. The base Public Affairs Officer is designing a car pool program to be presented at each of the Tidewater naval installations.

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Results of this effort by the Navy have been somewhat successful, with over 12,000 persons currently carpooling. The remaining 47,000 commuters, however, represent a significant number of potential carpoolers.

2. Official Business Travel

Vehicles also are used for official business. There are 246 Navy sedans at Sewells Point available for official business. These vehicles often are assigned to work stations for distribution. Recent surveys have been conducted at the Oceana installation to assess the number of unnecessary trips made per day and to evaluate how trips (particularly to other bases) can be avoided or consolidated to save gasoline. Data from these surveys can be used to determine the amount of gasoline consumed over a given period of time by official Navy vehicles.

Because of the limited number of government-owned vehicles available at each work station, the problems with scheduling their use, and an inadequate bus system on-base, the surveys indicate that many persons use their own automobiles for business travel on-base.

Based on the above and with the objective of reducing the number of automobiles used by Navy employees, the following recommendations are made.

B. Recommended Automobile Actions

Four primary actions are presented here for immediate implementation:

- A survey of the extent of on-base travel using private automobiles
- An intensified car pool program
- Park and ride (P&R) lots
- Auto disincentives.

Each of the action items is described below.

1. Survey of On-Base Travel

As envisioned, this survey would be sponsored and conducted by the Navy and implemented under the direction of the commanding officer at each installation. The survey questionnaire could be combined with a car pool survey to inquire specifically about the use of private automobiles by employees for both official business and personal errands on-base. The recommended survey would require staff personnel to administer the questionnaire (distributed to work stations), analyze the resulting data to identify problem areas, and come up with suggested solutions. This

information would be particularly valuable for determining the extent of on-base transportation needs and for developing transit service cooridors and schedules.

The on-base travel survey would require approximately one man-month of staff time for data analysis plus time for designing and administering the survey questionnaire. This effort could be combined with the next action item--carpooling.

Lead Agency:	Navy
Funding Agency:	Navy
Cost:	$5,000 (one-two man-months, + materials)
Timing:	Within first year

2. Car Pool Program

The immediate action recommendation is a continued effort to encourage carpooling at naval stations. Major elements of the recommended program include: redesign of the car pool-matching questionnaire, providing car pool incentives, conducting car pool forums, and assigning Navy staff to administer the program.

The survey data collected in 1974 on all Navy bases was a good first start, but is inadequate for an effective car pool program. The SVPDC has available a computerized car pool-matching program for regional use. The program could be modified for Navy use by adding on-base detail to the grid coordinates used by the region. Survey questionnaires would be distributed to Navy work stations with names, phone numbers, and hours of work of employees already filled in from employment rosters. Home address, home phone numbers, on-base travel information, and items dealing with personal preferences for car pools (smoking, nonsmoking, and the like) could be filled in by employees.

A Navy coordinator with assigned staff time would be required to administer the car pool program, distribute questionnaires, and collect responses at each naval installation. The coordinator would meet with transportation planners at (SVPDC) to help design the survey questionnaire, organize the collection of data on-base, analyze the data for errors, distribute resulting matched lists to commuters, and monitor the continuing update of information.

Distribution of matched lists can be accomplished in several ways; however, some methods have proved to be considerably more successful than others. The most effective method is employer-sponsored coffee hours or forums for carpoolers, with persons from matched lists invited to meet together to mutually select riders and arrange schedules. These meetings also serve as occasions for presenting short slide shows or other media describing the advantages of carpooling (dollar savings, reduced

driving stress,(social)benefits, improved safety). Persons formerly unconvinced of carpooling benefits may be encouraged to try it. Car pool posters, handouts, and bumper stickers also could be distributed at these meetings.[1]* Car pool forums also could be used to distribute information on other forms of transit, including public buses, subscription buses, or van pools. Other less successful, but still effective methods for distributing car pool matched lists include posting them on bulletin boards, mailing to individuals through company mail, or making them available through designated car pool coordinators.

Car pool incentives include formal recognition of carpoolers by Navy stations or the Fifth District. For example, the name of a carpooler drawn each week could be posted at building entrances, or a fuel gauge (similar to that used for blood drives) designed to show the amount of fuel saved by Navy employees because of carpooling could be displayed at main gates. Other incentives include car pool raffles, exclusive car pool lanes at gates and throughout the base, and enforced preferential parking for carpoolers.

Implementing the carpool program would be the primary responsibility of the Navy; however, SVPDC would be responsible for the questionnaire design and running the computerized program. Money for this effort has already been designated in the FY 1976 Unified Work Program--Task No. 404.14.3 for $2,600. Update of information on a yearly basis either would be included under existing operating expenses or could be a small fee charged to the Navy for running the program. The Navy's share would include administering the matching program, sponsoring forums, and providing incentives.

Lead Agency:	Navy; and SVPDC for computer time, program program questionnaire and design
Funding Agency:	Navy and SVPDC, Federal Aid Urban Funds, Section 9/Section 112 Funds
Cost:	Navy--4 man-months or $20,000; SVPDC--$2,600
Timing:	Immediate

3. Park and Ride Lots

A number of areas within the communities of Tidewater have already established Park and Ride lots. The Greenwood Interchange in Portsmouth is a prime example of efforts to promote this concept. Basically, Park and Ride implies just what it says: that is, a person drives from home to a designated spot (usually a parking lot), leaves the locked automobile, and joins a car pool group or bus to complete the journey to

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* All references are listed at the end of this report.

work; the process is reversed for the return home. Benefits of this approach are that door-to-door rider pick-up is alleviated, thus travel time is reduced, and persons save costs by sharing rides.

Information resulting from the recommended car pool matching program could be used to help identify potential new Park and Ride areas within the community. Shopping centers, churches, and other institutions with available parking space could be approached by SVPDC and the Navy to negotiate agreement on the use of lots for Park and Ride passengers.

Lead Agency:	Navy and SVPDC
Funding Agency:	None specified
Cost:	Minimal
Timing:	Immediate

4. Auto Disincentives

The "carrot and stick" approach for influencing the transportation characteristics in a community is well-known. Though the Navy offers a relatively controlled environment suitable to applying the "stick" (or auto disincentives, such as restricted parking or auto banned zones), these options are recommended for implementation only as other transit options become available.

Auto disincentives that could be implemented in the short term correspond closely to the car pool program and increased bus service. These include:

- Developing a long-range strategy in conjunction with transit improvements.
- Adding spaces and enforcing preferential parking for carpoolers and compact cars on base (particularly at Sewells Point).
- Reprogramming a need for the construction of new parking in major activity areas.

Auto discentives to be initiated at a later date as transit alternatives become available include:

- Imposing sticker fees on all single passenger vehicles proportionate to energy consumed (auto weight and horsepower).
- Charge parking fee for on-base parking; reduced fee for carpools.

- Beginning auto-free zones and further reducing parking.

This action is primarily one of policy formulation and implementation within the Fifth Naval District commands. Monitoring the effectiveness of disincentives, however, is of interest to other federal agencies, such as the Federal Energy Administration (FEA), Environmental Protection Agency (EPA), and the Department of Transportation (DOT). Thus, a study grant may be proposed to any of these agencies for developing and applying monitoring methods as disincentives are applied. (SRI has developed a computerized model for monitoring auto emissions and energy consumption.[2]) Estimated commitment for the Navy part of the program:

Parking enforcement: Patrol 8 hours per week; randomly = 52 man-days.

Administering sticker fee: 3 man-months = $10,000.

Savings to the Navy:

Parking lot construction $225/car = $500,000-$1,000,000/yr.

Potential income from sticker and parking fees that can be used for administering program and other transit programs, such as marketing transit and car pools.

Auto Disincentive Program:

Lead Agency:	Navy
Funding Source:	FEA, DOT, EPA
Cost:	$50,000 for a 1-year program using Urban Diffusion Model
Timing:	Short to midterm.

5. Feasibility of an Auto-Share Concept On-Base

Auto share is recommended as a midterm option for Navy consideration. The auto-share concept consists of maintaining a fleet of vehicles dispersed throughout the base for use by anyone having a pass or key. Vehicles are parked in designated areas on-base within easy access to potential users (e.g., along curbs or in turn-off lanes along roadways). Vehicles are usually small, two-passenger mini-cars, similar to the electric vehicles used by the U.S. Postal Service. Regular automobiles are banned from areas serviced by auto-share vehicles. The advantage of this type of service is that it is personalized and allows individuals new, door-to-door accessibility. It is particularly amenable to areas with a controlled boundary because the vehicles would not be allowed off-base. Commuters would use public transit and fringe parking lots and would travel by shuttle buses to work stations during peak hours. On-base

travel during nonpeak hours would use the fleet of small vehicles, bicycles, and buses.

The proposed action for the auto-share concept is to conduct a feasibility study of its application for Sewells Point. The study would be conducted by a transportation consultant or the Army Engineering Transportation Agency in cooperation with the Fifth Naval District--Norfolk. A funding agency has not been identified for this action, but would most likely be a sponsor desiring a test site for small vehicle technology, or a government agency (National Science Foundation or Office of Technology Assessment) interested in funding a technology assessment of the auto-share concept. The Navy responsibility would be limited to providing relevant data to the consultant and assessing the study results for implementation recommendations.

Lead Agency:	Consultant
Funding Source:	Interested sponsor (ERDA)
Cost:	Six-month feasibility study = $30,000
Navy responsibility:	Data support
Timing:	Midterm

III PARATRANSIT

The formal definition of paratransit is as follows:

> Para-transit services are those forms of intraurban passenger transportation which are available to the the public, are distinct from conventional transit (scheduled bus and rail) and can operate over the highway and street system.[3]

Paratransit options recommended for the Navy Area-Wide Transportation Action Program include conventional taxis, leased vans (standard vehicles with seating capacity of 8-15 passengers), private haulers (subscription bus service), and auto rapid transit (a modified jitney operation).

A. Conventional Taxis

1. Existing Situation

The Navy Exchange at Sewells Point contracted with a private cab company (Apollo Cab Company) to provide exclusive on-base taxi service. The service has been operational since 3 December 1974 and is contracted to run through 25 December 1975. The contract specifies exclusive pickup on-base to the contractee. Fares are 50 cents per person in the daytime and 65 cents at night. The service is a radio-dispatched operation. The company owns ten cabs; however, because of a lack of demand on-base, only two cabs are assigned to Sewells Point. The low demand for cab service has been attributed to poor on-base advertising and a lack of enforcement of unauthorized cab pick-up on base by competitors.

2. Recommended Action

a. Taxi Service Marketing Program

In an attempt to improve on-base awareness and use of the contracted taxi service, the following recommendations are made for immediate implementation:

- Add the taxi referral number to the phone directory, as well as the information service, once implemented.
- Include a notice of service in the "ship's plan of the day."

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- Post notices of service and phone number on bulletin boards.
- Distribute publicity bag stuffers at Navy Exchange and Commissary.
- Fine unauthorized taxis for pick-up on-base.

Most of the above recommendations can be implemented through the Fifth Naval District Public Affairs Office. Cost to the Navy would include financing, design, and printing of publicity material, and man-hours for distribution.

Lead Agency:	Navy (Fifth Naval District Headquarters)
Funding Source:	Navy
Cost:	$1,000
Timing:	Short-term

b. Fixed Route Taxi Service

Apollo Cab Company (the contracted exclusive on-base cab company) could potentially operate continuous pick-up service along major on-base travel corridors, such as between major work stations, commissary, exchange and clubs, during lunch hours and peak-hour traffic periods. The fare could be reduced to 20 cents or less with full passenger loads. Service would be requested by a passenger hailing from curbside. A taxi could display window cards, designating its destination, to further streamline service.

Routes not covered by bus service, and for which the on-base travel survey indicates a high level of demand, would be delegated to the on-base taxis. A two-month trial of this service could be implemented along one major corridor to demonstrate its potential. Marketing and public awareness of the service should precede the demonstration by at least one week and continue during the trial period.

Planning and implementation of this option should be the responsibility of the contractee and Navy Exchange.

Lead Agencies:	Apollo Cab Company and Navy Exchange
Funding Source:	Taxi riders
Cost:	Minimal advertising costs
Timing:	Immediate

B. Leased Vans

1. Background

A van is a standard commercial vehicle with a seating capacity greater than an ordinary passenger car, but generally not holding more than 15 passengers. The use of vans for meeting public transit needs is rapidly gaining popularity. To date, the most typical use of vans has been for providing transit to the elderly, school children, and other special groups of travelers. More recently, however, vans have become popular for a new use--vanpooling.

Vanpooling is a concept that is gaining recognition as an attractive way of reducing peak-hour congestion, cutting travel costs, and conserving energy. Like carpooling and buspooling, vanpooling is oriented primarily to serve a specific type of transportation need--the home-to-work trips, generally concentrated in the morning and evening peak periods of travel. Vanpools also may serve as an efficient travel mode for other purposes, such as shopping, medical, school, and social-recreational. As discussed in a companion report to Vanpools,[4] vanpools have been used to solve the problems of the transportation disadvantaged--the elderly, handicapped, and economically disadvantaged. Opportunities exist for more widespread organized use of vanpools for such purposes.

Like carpooling, vanpooling affords the convenience of door-to-door service and avoids the higher labor cost of providing special drivers required for buses. The principal advantage of the vanpool over the car pool, however, is the higher occupancy achieved. A disadvantage of the vanpool is the extra travel time needed to pick up the additional passengers, but this can be minimized if riders are well-matched and routes and schedules are properly planned.

A vanpool can be defined in terms of vehicle and operational characteristics that distinguish it from conventional car pools and bus pools. In terms of vehicle characteristics, a vanpool is defined as a pool of riders using a van type of vehicle, driven by one of the members of the pool rather than by a professional driver. The van is larger than a standard sedan and smaller than a conventional bus.

A vanpool operation can utilize a wide range of vehicle types and features. The type of vehicle selected for a given pool may depend on the number of riders in the pool, vehicle capital and operating costs, fuel economy, availability of existing vehicles, and other considerations. The special features of the vehicle--such as air conditioning, carpeting, and special seating--can be varied according to climate, commuting distance, and the particular needs and desires of the vanpool riders. Van type of vehicles with seating capacities ranging from 7 to 15 passengers are available as stock items from several manufacturers. Custom models with special seating arrangements also can be ordered from the manufacturers, or local jobbers can prepare custom interiors if such special features are desired. Special configurations will result in less than maximum seating capacity for a given van size, but can make the van more

luxurious and attractive with features such as more leg room, reclining or swivel seats, table tops for writing and games, television and music set-ups, and so forth. The cost of purchasing a van may vary from about $4,000 to $7,000, depending on the size and auxiliary equipment desired, the number purchased, and the place of delivery.

The incidence of employer-sponsored vanpools has increased dramatically since 1973. The 3M Company, for example, has launched a pilot program with six vans. As demand grew, 3M periodically purchased additional vans, and as of September 1974 had 67 in use. Likewise, other corporations, such as General Mills, Texas Instruments, and Cenex Corporation, obtained vans for a second or third time to meet surging demand.

The vanpools consist of pool coordinators, or drivers, with at least one back-up driver and a minimum of eight paying passengers. The drivers must have chauffeurs' licenses and are carefully screened for reliability. Drivers are responsible for the vans, and they ride free in return for driving and collecting monthly fares. Monthly fares, figured on a break-even basis of eight riders, range from $19.50 to $39, depending on distance. The $39 fare serves a round-trip distance of 135 miles. As an incentive to the pool coordinator to keep the van full, the driver pockets the fare of the tenth, eleventh, and twelfth riders. He is also allowed to use the van at night and on weekends for a small mileage charge.

By any measure, the 3M commute-a-van program has been an outstanding success. The average van carries 11.36 persons for a monthly fare of $23.72 and a round-trip distance of 49 miles. The shift to vans saves over 1.4 million vehicle miles of travel and 108,300 gallons of gas per year. The vanpool project reduced the size of a planned 3M parking structure from 1,500 to 775 spaces, saving two and a half million dollars. In addition, the number of carpooling employees has expanded threefold to approximately 3,000 since the energy crisis began. Overall, 40% of all employees are participating in ride sharing, certainly one of the highest rates in the country.

2. Existing Situation

The Southeastern Virginia Area Model Program (SEVAMP) for the aging and handicapped operates demand-activated vans and minibuses in Tidewater. The service employes full-time drivers to operate some 40 vehicles daily. This service will become part of the Tidewater Transportation District Commission (TTDC) in the near future.

Approximately 30 Navy employees are registered to operate vanpools to their work stations in the Sewells Point compound. Each van carries from 8 to 12 commuters who share the expense of the trip. These services provide transit to neighborhoods of Navy commuters not well-served by conventional transit (buses) and also represent an intermediate transit option between carpooling (6-passenger maximum) and scheduled bus service. It is recommended that this form of transit be encouraged further by making vans available to Navy users through the TTDC.

3. Recommended Action: A Demonstration Project

Because the Navy represents a healthy portion of Tidewater transit users and also offers a controlled environment for testing new transit ideas, it is recommended that TTDC propose a Van Leasing Project in cooperation with the Navy. This project will demonstrate how a large employer in a r ion, such as a major military installation, can use vans to fu' transportation needs not met by conventional public transit.

As with many military installations in the United States, the Navy in Tidewater has a wide variety of transit needs requiring a multimodal transportation system that can offer a flexible response to changing demands. Examples of Navy situations that require a flexible transit system include the following:

- Training schools requiring up to five-month residency--students live either in dormitories on-base or commute from their ships.
- Irregular work hours--as in flight training schedules or overtime work.
- Clusters of military housing scattered throughout the community--mostly short-term residency because of frequent duty reassignment.

A leased van operation could serve these transit passengers in a responsive way and still be cost-effective to the community. The demonstration will serve as an example to other major employers or service groups in Tidewater on how to make transit responsive to their needs.

a. Demonstration Project Operating Guidelines

It is recommended that the TTDC serve as broker to the Navy Exchange at Sewells Point, which will in turn administer the leasing program to Navy users. Vans could be leased by the Exchange to Navy applicants, such as: prospective vanpoolers (modeled after the 3M program, a group of Navy classmates in training schools, Navy wives club for a shoppers' shuttle service, and retired or handicapped Navy personnel for recreation shuttle (in coordination with SEVAMP).

Contracts would be issued to vanpool operations allowing the Navy to use the vehicles for daytime transit needs. The Navy, then, would reimburse the van program for the vehicle mileage, beginning and ending recorded by the exchange coordinator and subtracted from the vanpool operator's mileage. Vehicles used for this purpose would cleaned and inspected before their return to vanpool operator to maintain pride in the vehicle. The advantage of the multiuse vehicle is the added revenue provided to the project's operating fund.

The Navy Exchange, under the direction of a TTDC program supervisor, would be responsible for marketing the program, along with the Navy Public Affairs Office. It also would receive and screen applications for vans; select vanpool coordinators; maintain records; collect and transfer payments to TTDC monthly; and supervise inspection, repair, and maintenance of vehicles, and storage of vehicles not in use.

The Navy Exchange currently operates a vehicle maintenance service. At the onset of the van program, however, repair and maintenance of vehicles may have to be contracted out until additional facilities and mechanics are available to service the fleet efficiently.

The demonstration program would include a full-time staff position for TTDC to supervise the program with the Navy Exchange and coordinate it with the total regional system. TTDC would also receive and administer grant funding and be responsible for purchasing the vehicles. The demonstration grant money would include funding for Navy Exchange personnel, office space, and support services shared by both van program coordinators. The demonstration program is designed for 18 months, beginning with the purchase of 10 vans and increasing in increments of 10 over an 18-month time period to a fleet of 50-60 vans.

The success of the program is largely dependent on marketing and incentive to use the full potential of the service. At the onset of the program, an extensive public awareness program will be conducted at Navy installations. Forums will be held at each major work station to inform potential users of the service. A brief presentation should be made on the demonstration project and its objectives. Van program coordinators would be introduced and flyers would be distributed showing potential savings to vanpoolers and identifying application procedures.

Incentives may include the offer for added income to vanpoolers with over eight passengers (income from passengers 9, 10, 11, and 12 is returned to the driver). Another incentive would be close-in parking at work stations for all vans in the program.

b. Capital and Operating Costs

Vehicle capital and operating costs vary with the type of vehicle ownership, amount of travel, and operating conditions. The cost for operating the 3M vanpool, based on the following estimates prepared in September 1973, serves as an example for the proposed program costs. Assuming 250 working days per year, the unit costs for operating a 3M-owned van are $6.10 per day plus $0.055 for each mile driven. However, operating costs are higher in 1975 than in 1973. Assuming gasoline costs of $0.54 per gallon, the total operating cost would increase from $0.055 per mile to $0.07 per mile.

Fixed costs	
Vehicle costs	
Retail price	$5400.00
3-year trade-in value	2500.00
Net 3-year cost	$2900.00
Annualized capital costs	$ 967.00
Annual insurance costs	460.00
Annual license costs	80.00
Total annual fixed costs	$1507.00
Operating costs ($/mile)	
Maintenance $100/10,000 miles	$ 0.01
Gasoline 12 mile/gal @ $0.36/gal	0.03
Oil $10/2,000 (incl. filter)	0.005
Tires $200/20,000 miles	0.01
Total operating costs	$ 0.055

Based on the above established figures along with location specific adjustments, the proposed demonstration project budget is as follows:

	Costs
60 vans @ $6,000 purchase price	$360,000
Annual insurance, $60 x $400	24,000
License costs $60 x $105*	6,300
2 van program coordinators (1 TTDC, 1 Navy Exchange)	30,000
Office space and supplies	8,000
Marketing	2,000
Total	$430,300

A fare structure based on mileage per day can be established to cover operating costs paid from a common pool of money.

*License costs include $40 city tax and a $25 first-year Virginia State Corporation Commission tax.

Emergency repairs and gas can be paid for by drivers (lessees), who would then be reimbursed from the operating cost pool. The Navy Exchange would be responsible for collecting fares and establishing the common fund. Regular vehicle servicing, tires, and major repairs would be handled by the Exchange, reimbursed from the grant funds initially and eventually by operating costs. Annual insurance and license costs also would be funded under the grant during the first year and eventually included under operating costs covered by fares.* (See Table 2, Division of Costs over Four Years).

Once the fare structure stabilizes to support the above costs, expansion of the program can begin. A continuing fund apart from the operating fund pool could be established to help finance the purchase of additional vehicles.

Budgeting and accounting would be the joint responsibility of TTDC and the Navy Exchange. Grant funds would channel through the TTDC to be used as operating costs until fares are able to cover the costs. New vehicles would be purchased by TTDC, and coordinator salaries would also come from TTDC. The Navy Exchange would reimburse drivers for gas and passenger loads exceeding the break-even costs, based on eight passengers. Eventually, the Exchange would assume full accounting responsibilities for operating the Navy Van Program. TTDC would continue to coordinate the Van Program with other area transit and would use the experience of the Navy Program to help other major employers initiate area-wide van service.

c. Evaluation

The demonstration project would be monitored and evaluated by the Department of Transportation, Transportation Systems Center for UMTA. The TTDC staff supervisor would be responsible for working with a Navy transit coordinator (to be identified) to evaluate the demonstration program for its feasibility for Navy-wide application and its effectiveness for reducing single passenger automobiles on Navy property.

Lead Agency:	TTDC, Navy Exchange
Funding Source:	DOT, UMTA, Office of Transit Planning, Service & Methods Demonstration
Cost:	$430,300--100% demonstration grant
Timing:	Immediate--submittal of grant request

*License costs include $40 city tax and a $25 first-year Virginia State Corporation Commission tax.

Table 2

DIVISION OF COSTS OVER FOUR YEARS: VAN POOL PROGRAM

Source of Funds	Year 1		Year 2		Year 3	Year 4
	First Six-Month Period	12 Months	18 Months	24 Months		
Demonstration grant	Purhcase of 60 vans Licensing Insurance Coordinator Marketing	Coordinator and marketing	Coordinator and marketing TTDC evaluation	--	--	
Operating revenues	Fuel, oil, etc. Maintenance Repair Insurance Reserve pool	Fuel, oil, and such Maintenance Repair Insurance Reserve pool	Fuel, oil, and such Maintenance Repair Licensing Insurance Reserve pool New vehicles*	Fuel, oil, tires, and such Maintenance Repair Insurance Reserve pool New vehicles Coordinator's salary	Same as 24 months plus license	Same as Year 3 plus replacement of original vehicles*

*For expanded service from reserve pool.

C. The Private Haulers (Subscription Bus Service)

1. Existing Situation

The private haulers are currently indigenous to the Navy, although they can be used at similar large employment centers where public transit service is limited. These privately owned buses are typically limited to bases with a large number of commuters entering during the peak hours, and the basic concept is much like an expanded car pool. A regular employee owns an old school bus or an intercity of transit bus which he uses to drive to work. For a small fee, usually five dollars per week, he transports coworkers with similar working hours and compatible residence locations. Of the little more than 100 privately owned-operated buses in use in the Tidewater area (a few are owned by small companies which pay the drivers and allow them to ride for free), 93 to 97 private haulers are registered to go onto the Sewells Point facility, though fewer make the trip regularly. Origin points range from Portsmouth. There is one private hauler at Little Creek.

Compared to publicly owned transit, the private haulers can operate at a slight profit because they provide supplemental peak-hour service without incurring any off-peak deficits. Some drivers might want to use vehicles for midday service (lunch trips) for themselves or with other Navy drivers, and some operate charter trips on request, particularly on weekends.

The private hauler buses have a steady ridership primarily of blue collar workers who often work at the same stations and live in the same neighborhoods. Thus, a camaraderie develops among the riders, resulting in a friendly atmosphere not unlike that of a private club. Seats are sometimes assigned to steady riders so they can always sit close to their friends. At least one bus is equipped for stereo music, and the riders sometimes group sing on the way home from work. Holidays are celebrated with special decorations, costumes, and festivities by a few operators. In short, riders appear to enjoy the use of group transit. This atmosphere is worth preserving and may offer useful hints for promoting successful transit service. The private haulers at present represent an unorganized institution, developed completely independent of Navy and government intervention, and therefore, it is recommended that any additions or improvements to the private haulers' service be carried out by the owners, drivers, and riders. The purpose of the proposed action is only to facilitate the improvement of this service.

Most of the eixsting vehicles are very old, run-down, and virtually unsafe. Their physical condition may be responsible for scaring off potential riders, especially since several of the buses often break down, causing potentially hazardous conditions, especially on freeways, and lost time, some of which the Navy pays for. A number of private hauler operators are mechanics by profession or hobby; this usually allows for on-the-spot repairs, but nonetheless results in travel delay.

Determining specific information about routes and schedules of the private haulers is difficult. (At the present time, this is transmitted by word of mouth.)

2. Recommended Actions

a. Navy Actions

The Navy may assist the private haulers in a number of ways. One way is to allow drivers slightly flexible working hours, such as a start and stop time 15 minutes earlier than official hours In the morning, this would allow extra time to circulate around the base to distribute passengers to their work stations. In the afternoon, drivers would have time to start the buses and check mechanical problems. If they were to have trouble, then they could ask their coworkers to help while they were still available. An early stop time could also allow for passenger pickup. The extra time (if not made up by arriving at work early) allocated by the Navy could be made up with a shorter lunch period. However, this is an opportunity for the Navy to offer a supportive role to encourage use of transit, and therefore, it is recommended that the no-penalty system be initiated.

Another recommended Navy action involves the Portsmouth Naval Shipyard where private haulers are not allowed to move until 4:10 p.m., whereas other commute traffic is allowed to leave at 4:00 p.m. The reasons given for the time difference are that the private haulers are parked in one area, and it takes the drivers time to get to this lot by bus; it is claimed that if motorists, pedestrians, and buses were to try to leave simultaneously, there would be serious traffic and safety problems. Such an attitude is definitely not supportive of transit use. Instead, it is recommended that buses and pedestrians be allowed to leave first and that cars be restricted for a period of about seven minutes. If this is met with overriding opposition from shipyard personnel, then, as an intermediate step, the buses should be allowed to leave at the same time as the automobiles.

A third option for Navy support to private haulers could include preferential parking at work stations. Also, strategically located terminals (shelters) could be provided when several buses are involved.

The above recommended actions fall under the direct responsibility of the Navy. The following recommended action, however, will require federal funding to implement.

b. Demonstration Project to Form an Association of Private Haulers

A flexibly structured confederation of the private haulers could help improve the bus service by providing services and incentives

that the drivers cannot supply individually. Key services of an association would be providing information for building ridership; making available group liability insurance; securing parts and equipment; and providing repair services, safety inspections, and possibly the bulk purchase and distribution of gasoline.

At the present time, a complete list of the private haulers or the routes they operate is unavailable. An association could prepare such a list (including maps and schedules if desired) and make it available directly to potential riders as well as to Navy offices, any carpooling programs, and a transit information center. Even if an association is not formed, this task should be pursued. This information and marketing effort could result in an increase in ridership at little cost. Any increase in ridership would be likely to encourage private haulers to form an association.

The option of group insurance could be another incentive for an association of private haulers. Owners currently pay as little as $400 per bus per year for each bus in a small fleet, and as much as $1,000 per year for individual buses that run charters in addition to regular commute service. The different buses also are insured by a variety of different insurance companies. As association would be able to negotiate for more favorable insurance rates for its members than the drivers could on an individual basis. The savings alone could be as high as 15-20%. Operators could use the savings to upgrade their equipment or service, to pay dues or contributions for ongoing association operations, or even to increase their own income.

One legal problem may exist with the formation of an association of private haulers for the purpose of saving money on insurance. The action may be illegal because of unfair discrimination in violation of state and federal laws. It is important that insurance agents not be associated with the group in its forming stages. The main purpose of the group should be expressed as the promotion of greater safety, accomplished by group safety meetings, safety bulletins, information, rules and regulations, and internal equipment inspections. It might also save money on bulk purchases of gasoline, oil, tires, parts repair services, and insurance. For insurance purposes, each member would still be rated individually, according to distance traveled (less than 15 miles, 15-50 miles, more than 50 miles), type of bus, capacity, size, history of vehicle and driver (over the last one to five years usually), and licensing.

Liability insurance coverage should probably be negotiated with a single insurance broker representing a national firm or with a well-established local firm with a long history of business in Norfolk. The coverage should be obtained for limited passenger service to and from work, not by means of a public common carrier or by taxi. If the association enjoyed a high rate of membership participation (80 to 90% of the private haulers) and the insurance carrier were given the privilege of individual evaluation of each member's application (typically 2 to 8 percent of the applicants might be rejected), then an insurance company could offer as much as a 15 to 20% reduction in premiums.

The association could negotiate special rates on parts, equipment, tires, and oil, and perhaps could arrange for bulk gasoline purchases for its members. Gas distribution also could be handled; drivers would be allowed to refuel or service their vehicles at or near the Navy base they serve, and the association could stockpile gasoline at key storage locations in the community. This organizational setup will prove to be particularly attractive if gasoline is rationed or if fuel shortages occur in the future because in all probability an association would receive more favorable consideration than would individuals. An association perhaps would be successful in negotiating with the Commonwealth of Virginia so as to eliminate or reduce the excise tax on the fuel purchased since it could be considered a bona fide mass transit operator. Finally, to purchase parts, new equipment, or to contract repair services, the association could act as an intermediary to secure loans from the Small Business Administration, especially under its Minority Business Program.

Although initially the association's activities would be limited to gathering and disseminating information, potentially it could exercise the option of group liability insurance and bulk purchase of gasoline and parts. If successful, members could expand the association's activities to include tax, accounting, and legal services, purchasing or location of additional equipment (monitoring nationwide equipment recycling resulting from new transit capital grants), or perhaps contracting for repair services, catering services, and club activities.

Phase I--The initial phase of this project as envisioned would entail the hiring of a full-time staff person to analyze the potential of the idea and to develop a plan for implementation of the association. The staff position duties also would include making an inventory of all of the existing private haulers' routes and schedules and preparing a series of maps or timetables for public distribution by the drivers, Tidewater Transit District, and others. The newly funded staff position ideally would be filled by a retired or unemployed private hauler, but also could be a former passenger or Navy person. In any case, he should be fully cognizant of needs and attitudes of drivers and passengers.

The project budget could be used to sponsor a series of social hours or banquets to which the private haulers (and perhaps their wives) would be invited. During the course of the evening, the organizer and his associates could talk with the drivers to determine their attitudes and obtain their individual suggestions. This idea-generation session should be held early in the formation process so that it can help shape the organizer's work plan.

The administrative expenses of the position would be funded under the Tidewater Transportation District Commission. This would enable the organizer to take advantage of TTDC office facilities and support staff and to enjoy good transit agency liaisons. After a period of six months, the work the organizer has done should be evaluated and at this

time a vote taken among the private haulers to see if they are interested, in principle, in forming an association.

Phase II--If a majority of participants wished to go ahead, the program would go into a second phase--formalizing the association. It is proposed that the organizer would leave TTDC to become the new association's staff person, but he would maintain continuity with TTDC by sitting on the CTS Technical Committee.

Care also should be taken to prevent violation of anti-trust regulations as a result of the treatment of private haulers who choose not to join. To avoid these pitfalls, the association should retain legal counsel during the formation period. The attorney could also draw up standard contracts and waivers and advise members on specific legal questions.

Grantor, grantee, cost estimate, and local share for this action are summarized below. The Phase I cost estimate is based on a $7500 six-month salary for the full-time organizer, including fringe benefits and payroll taxes; $1500 for part-time secretarial and clerical help; $1000 legal fees; and $5000 for office expenses, including rent, supplies, telephone, and so on, plus printing and distribution of maps and sponsoring a banquet. Phase II expenses are double those of Phase I to reflect an additional twelve momths' operation beyond the first six, plus $5000 for incorporation and start-up costs. After the first year and a half, it is anticipated that association dues and fees from contracted services would finance operating costs.

Lead agency:	TTDC
Funding source:	UMTA (Office of Transit Management--Paratransit)
	Small Business Administration
	Minority Business Program
Cost estimate:	Phase I (six months), $15,000 Phase II (twelve months), $35,000
Local share:	Navy--Supportive action; parking, 15 minute work flexibility for drivers, marketing, shelters
	TTDC--office space, staff support
Timing:	Immediate grant request

D. Auto Rapid Transit: A Modified Jitney Operation

The following describes the concept for auto rapid transit as proposed to SVPDC by its originator, Mr. William Mann:

A New modified jitney mode of transportation is proposed called Auto Rapid Transit (ART) that could become popular for peak period work travel in an energy conservation economy.

Conceptually, it uses the services of citizens making work trips as transit drivers and their private cars as transit vehicles.

The appeal is that drivers would supplement their regular incomes with transit fares from passengers and passengers could get a cheap, line-haul high frequency level transit service.

The establishment of Regional Transportation Centers (RTC) would be crucial to successful operation. Since the greatest potential for this concept would be serving work trips between suburbs and downtown areas, RTCs would have to be established at strategic locations. They would serve major transfer points for Auto Rapid Transit users as well as regular carpool and bus services. The Auto Rapid Transit service should increase the use of carpools through establishment of collection points and backup systems. It should decrease the need for public transit line-haul peak period service and increase the demand for off-peak line-haul bus service.

The Auto Rapid Transit vehicles would not be allowed to operate in off-peak period between RTCs. This would improve the transit industry's economic position.

This new mode of travel should be considered as another low-cost means of using the available seating capacity in peak travel period transportation systems. Proper legislation would have to be adopted and a demonstration program undertaken to gain experience in implementing this system nationwide.[5]

1. Demonstration Costs

The cost of an ART demonstration project is estimate at about $400,000. Based on operation in three corridors for six months, the cost estimates are tabulated below.

	Costs
Overall management	$200,000
Rental of suburban parking spaces (i.e., regional shopping center lots)	75,000
Traffic engineering signs and vehicle display signs mounted	50,000
Insurance (provided free to the first 50 applicant drivers in each corridor) Assume $300 for six months	45,000
Advertising	30,000
Licensing--paid to local jurisdiction by applicant (approximately $5 each)	--
Bus service--no additional service needed during demonstration	--
Total	$400,000

Since the success of a demonstration project would be contingent on its ability to attract drivers, economic incentives in the form of free insurance to the first 50 applicants could be used in each of about three selected corridors. This could be arranged through one insurance company. The three suburban RTCs would have to be established at highly accessible locations such as regional shopping centers; a parking space rental arrangement with the shopping center managements would be required.

Once the demonstration project proved successful, the only public investment to implement the system on a regional basis would be for construction of permanent RTC facilities, mostly parking lots. No regional authority would be required to coordinate routes, schedules, or number of licensed drivers. The routes would be established as line-haul services between RTCs, and the frequencies and numbers of drivers would be market-responsive.

The fare structure could be recommended by a regional transportation authority that also would set standards for vehicle identification and driver licensing. Local jurisdictions would grant business licenses and operators' permits.

The above description of the Auto Rapid Transit is part of a proposal by William Mann to SVPDC for endorsement. The regional commission expressed an interest in pursuing the concept further and encouraging a demonstration project.

2. Recommended Action

On behalf of the Navy, it is recommended that the corridors for Auto Rapid Transit be selected to respond to major Navy commute patterns. (This information is available and would be updated by the proposed car-pool-matching program, if implemented.) The Navy could market the idea through forums, the car-pool-transit coffee hours, public notices, and so on. Navy commuters could be encouraged to become members of the Auto Rapid Transit. Shared Auto Rapid Transit vehicles could be given on-base stickers to allow for Navy passenger drop-off, or passengers could be dropped at transfer points coordinated with an on-base circulation system.

Lead agency:	SVPDC/Consultant
Funding source:	Private Foundation, or UMTA
Cost estimate:	$400,000
No matching money required	
Local share Navy commitment:	Supportive role (travel data, information dissemination)

IV BUSES

A. Bus Transit in the Tidewater Area

At the present time, there are five public transit operators in the Tidewater region. These are Tidewater Metro Transit (TMT), Community Motor Bus (CMB), South Norfolk Transit (SNT), the Elizabeth River Tunnel Commission (ERTC), and the Carolina Trailways Company (CTC). In 1973, the State of Virginia created the Tidewater Transportation District Commission (TTDC) as a state political subdivision and authorized legal transportation agency to apply for and allocate state and federal funds. It is also responsible for short-term transportation planning and the operation of transit services in the Tidewater area. Its immediate task is the consolidation of the existing bus systems into a $14 million regional network.

Limited bus service is also provided by the Navy for both inter- and intrabase official travel. Recommendations for both forms of bus service, public and Navy, are presented later in this section.

1. Existing Public Transit Services

Tidewater Metro Transit--The largest transit property in the area, TMT primarily serves Norfolk, but it also operates routes to and within Virginia Beach and parts of Chesapeake. Formerly the privately owned Virginia Transit Company, the TMT was acquired on March 9, 1973, by the City of Norfolk. The city currently must subsidize an annual operating deficit that amounts to $907,000 for FY 1975. Service in Chesapeake and Virginia Beach is operated under contract with the TMT, with all costs and revenues allocated to each city. Virginia Beach's share of the deficit for the current fiscal year will be about $226,000. The TMT operates 26 weekday routes, covering about 11,000 daily bus miles in Norfolk, 2,700 bus miles in Virginia Beach, and almost 500 bus miles in Chesapeake. Weekend opeations cover one-half to two-thirds of weekday bus miles. The basic fare is 35¢, plus 10¢ for each additional zone. Peak-hour headways average 10-30 minutes in Norfolk and twice that range in Chesapeake and Virginia Beach. The TTDC currently is negotiating with the City of Norfolk to purchase Tidewater Metro Transit for the sum of $2.25 million.

Community Motor Bus--The CMB, second largest transit operation in the region, operates routes in Portsmouth, Chesapeake, and Suffolk. CMB operates 15 weekday routes predominantly in Portsmouth; three of these routes serve Chesapeake and Suffolk also, and another three serve Chesapeake and Portsmouth. There are another six routes of 489 bus miles in

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Suffolk. Thus, with a total of 21 routes, Portsmouth enjoys 79% of the total service provided, but must share in only 47% of the $400 daily deficit because it has 8 profitable routes. Chesapeake receives 8-9% of the service for 38% of the deficit since it has only 140 riders, and Suffolk gets 12-13% of the service while paying 15% of the deficit. The system operates at approximately 90% of weekday levels on Saturdays and 35% on Sundays. Fares are zoned, with a basic fare of 35¢ and 5¢ for each additional zone. Except for the Douglas Park-Cavalier Manor Route 4, which operates every 18 minutes throughout the day, service on other routes in Portsmouth and Chesapeake is every 25 to 90 minutes in the day and evening. Three routes in Suffolk operate on hourly headways; the other three operate every 20 to 23 minutes in the daytime. There is no evening service in Suffolk.

The TTDC is expected to sign a contract to purchase CMB for $650,000 and take over its operations on May 4, 1975.

South Norfolk Transit Company--The SNT operates a single route between several northern Chesapeake neighborhoods and downtown Norfolk, operating closed door within Norfolk. The fare is 35¢. There are two round trips per hour in the morning peak period and one round trip hourly until 6:00 p.m. The TTDC has signed a contract to purchase the privately owned SNT for $22,000 and is expected to take it over on May 4, 1975.

Elizabeth River Tunnel Commission--the ERTC owns a cross-river shuttle between the Norfolk and Portsmouth central business districts. It is operated by Tidewater Metro Transit. Fares are 10¢. Peak-period headways average 10 minutes and off-peak, 20 minutes. The ERTC will be donated to the TTDC by the Commonwealth of Virginia and Tidewater Metro Transit.

Carolina Trailways Company--The CTC provides express bus service between its Virginia Beach ocean-front terminal and downtown Norfolk, with a flag stop at Oceana. It operates five round trips daily. It also operates ten buses daily between Norfolk and Suffolk.

2. Features of the Current System

Intercity Travel--Current transit service between different Tidewater area jurisdictions does not meet regional travel demands. Operating restrictions and the difficulty of agreeing on interservice transfer financing limit the intercity routes. Even where intersystem transfers are feasible, the transit service is inconvenient, principally because of undue transfer waiting time, multiple transfers, and lack of bus shelters. Further inconvenience results from a generally low-level dependability of bus service, which ranges from a 40-65% schedule adherence. A public transit rider wanting to travel from Portsmouth to Norfolk must take a bus from Portsmouth to the end of the ERTC line, transfer at ERTC to cross the river, and transfer again to Tidewater Metro Transit

on the other side of the river. Many of these problems will be alleviated by consolidation of the separate systems into the TTDC.

City-to-Suburban Travel--Many bus routes stop at the cities' edges, while travel demands extend beyond each city's limits. The lack of adequate radial and circumferential routes thus leaves transit needs unmet. These needs are met largely by increased private auto travel, taxis, or other modes, and in the case of the Naval installations, by private haulers, described in the previous section.

Amenities--To date, riders of area bus systems have not enjoyed a high level of transit amenities, although the situation is changing. Many of the existing coaches are outdated, uncomfortable, and unattractive; however, 47 new coaches have been added, and 50 new bus shelters have been installed. Additionally, in the past, information on bus routes, schedules, and transfers has been hard to come by.

Congestion Costs--A substantial degree of peak-hour auto congestion apparent along radial corridors and near major employment centers in the Tidewater area is evidence that available bus transit is either inadequate or undesirable for meeting commuter needs.

3. Transit Services to and from Navy Installations

Table 3 lists the residence zones having the most Navy commuters to each base and the transit available to accommodate these trips.

Public transit service to Sewells Point is now provided by TMT's Naval Base Route 2, Route 3, Chesapeake-Mason Creek, and Route 35, Naval Base Express. Routes 2 and 3 are illustrated in Figure 1. Route 2, serving the western areas of the base from downtown Norfolk, provides morning peak headways of 9-15 minutes, afternoon headways of 12-23 minutes, and a midday headway of 22 minutes. This route enters at Gate 1 and loops around Decatur, Dillingham, Maryland, and Gilbert Streets within the base. During peak periods, this service is supplemented by three No. 35 Naval Base Express buses leaving from Virginia Beach in the morning and returning in the afternoon.

The Chesapeake-Mason Creek Route No. 3 is a seven-minute shuttle from Ocean View Station (and connections with the main portion of the Chesapeake route, 1-Granby, and the 24-Tidewater Flyer) to Gate 4. It operates every 20 minutes during the morning peak and every 25 to 40 minutes until 6:50 p.m. There is only one bus after that in the evening, at 9:15 p.m. In addition to its infrequent service, it does not travel onto the base, and it is sometimes necessary to transfer to another bus to go downtown or to Ocean View.

Transit service to the Shipyard from within Portsmouth is provided by Community Motor Bus. The Navy Yard route operates at 60-minute

Table 3

MAJOR NAVAL PERSONNEL RESIDENCE ZONES AND EXISTING TRANSIT

Residence	Number of Commuters	Existing Transit (excludes private haulers)	Headways
Work trips to Sewells Point			
Sewells Point	5528	On-base Navy bus Apollo Cab	30 minutes on demand
Northern City of Norfolk	14616	Route 2 Navy Base	AM peak 9-15 min Midday 22 min PM peak 12-23 min
		3-Mason Creek	AM peak 20 min otherwise 25-40 min
Southern City of Norfolk	5934	2-Navy Base	AM peak 9-15 min Midday 22 min PM peak 12-23 min
Portsmouth	3484	No direct service	
Chesapeake	3627	No direct service	
Little Creek	239	One transfer required	
Northern City of Va. Beach	2004	No direct service	
Southern City of Va. Beach	9039	34-Navy Base Express	3 trips

Table 3 (Concluded)

Residence	Number of Commuters	Existing Transit (excludes private haulers)	Headways
Work Trips to Little Creek			
Northern City of Norfolk	1221	1-Granby 8 Little Creek	10-20 min 40-50 min } peak hrs
Southern City of Va. Beach	1123	No direct service	
Northern City of Va. Beach	580	32-Shore Drive	2 trips
Work Trips to Oceana and Dam Neck			
Southern City of Va. Beach	4231	No direct service	
Oceana and Dam Neck	2031	One 20-passenger Minibus proposed On-base bus	60 minutes 30 minutes
Work Trips to Naval Shipyard			
Portsmouth	4832	Navy Yard route	60 minutes
Chesapeake	2121	No direct service	

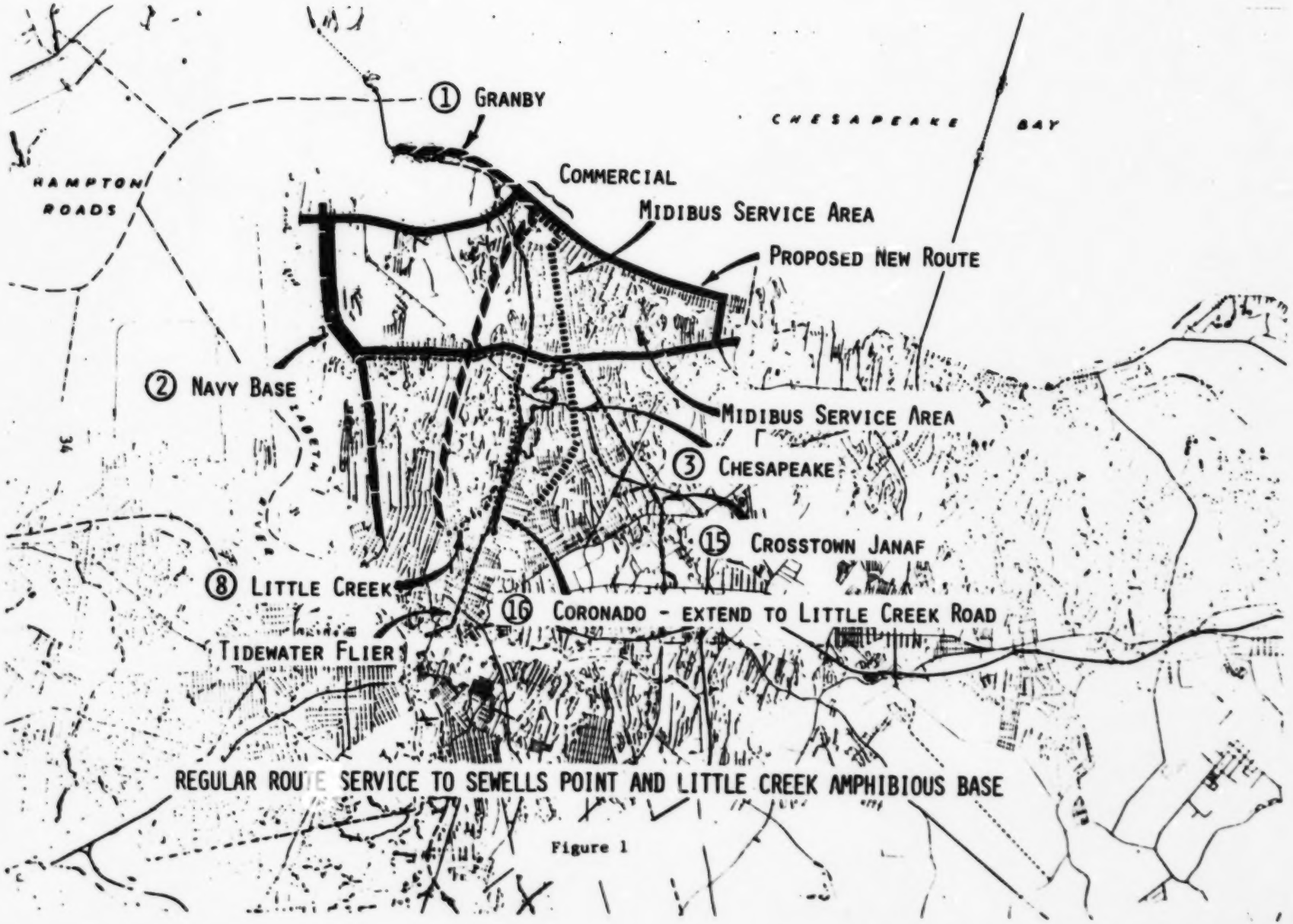

1 GRANBY
CHESAPEAKE BAY
HAMPTON ROADS
COMMERCIAL
MIDIBUS SERVICE AREA
PROPOSED NEW ROUTE
2 NAVY BASE
MIDIBUS SERVICE AREA
3 CHESAPEAKE
15 CROSSTOWN JANAF
8 LITTLE CREEK
16 CORONADO - EXTEND TO LITTLE CREEK ROAD
TIDEWATER FLIER
REGULAR ROUTE SERVICE TO SEWELLS POINT AND LITTLE CREEK AMPHIBIOUS BASE

Figure 1

headways, both peak and off-peak. It serves Gates 3, 10, 15, and 18, which handle the bulk of the Shipyard's travel demands. There is also one round trip per day to the Navy Yard on both the River Park and Cavalier Manor lines. No public bus service is operated to the Yard from outside of Portsmouth. The Naval Hospital is served hourly by the same bus that goes to the Shipyard, although it is designated as a different route--Navy Hospital-Shea Terrace. This route approximately breaks even, with costs and revenues both equal to $76 per day.

Gate 1 of the Little Creek Amphibious Base, which is near the piers where ships are docked, is served by the Little Creek Route #8 of the TMT, and by the 1-Granby. Gate 5, which is near the administrative area of the base, the Exchange, the Commisary, and the Dispensary, is not served by public transit, except for two a.m. and three p.m. trips by Route 32-Shore Drive (which ATE has recommended to be reduced to one trip daily). Transit is virtually nonexistent at the Oceana and Dam Neck areas. The main gates at Oceana and Dam Neck are located far from the one bus route in the area, #34-Virginia Beach line. The April 6, 1975 working paper on Dial-a-Bus in Virginia Beach recommends one service area which includes Oceana, but it would be served by only one minibus operating at a 60-minute headway.

4. Projected Public Transit to the Navy Installations

Several changes are expected in the near future in the public transit services offered Navy personnel. Largely as a result of the Navy's employment and residence survey, the consulting firm of Wilbur Smith & Associates has proposed to the TTDC that the TMT's Naval Base Route #2 from Sewells Point to downtown Norfolk be extended across the river to the Shipyard and perhaps into downtown Portsmouth as well (see Figure 1). Because this would combine routes currently held by the TMT, the ERTC, and the CMB, it is anticipated that this route extension would no become operational until after all of these properties are consolidated into the TTDC.

Wilbur Smith & Associates also recommended the creation of a new Little Creek-Naval Base Route. This line would commence at a point within the Navy Amphibious Base, leave from Gate 4 or 5, turn right on Shore Drive, left on Little Creek Road, right on Hampton Boulevard, and then continue on the Naval Base Route. The consultants recommended a minimum 10-minute headway during the two peak-hour periods and 60-minute service midday, with a calculated route requirement of eight buses for the peak-hour service and four buses for midday operations. Though these recommendations will certainly be an improvement to the existing system, much more will be required to provide effective transit for Navy commuters in Tidewater (Figure 1).

B. Recommended Short- and Midterm Bus Actions

The recommended bus actions are routing, amenities, marketing, and incentives. Each of these is discussed below.

1. Routing: Expand Routes and Scheduling to Benefit Navy Clientele

The TTDC could augment its service in four ways that would better serve Navy clientele. The four plans, which are described in detail below, are as follows:

- A new consolidated route in Ocean View.
- Bus rerouting in Portsmouth, including service from the Greenwood Interchange Park-N-Ride lot (now under construction) to the Shipyard and eventual service to Sewells Point.
- Additional express bus service from Virginia Beach and Portsmouth to Sewells Point and the Shipyard.
- Jitney or minibus service to Oceana, Dam Neck, and adjoining residential communities.

Consolidated Route in Ocean View--A circular bus route through Ocean View and Northern Norfolk could connect the Sewells Point and Little Creek Amphibious Navy bases and circulate through both of them. The route would consolidate portions of four existing routes--namely, the entire Mason Creek section of the 3-Chesapeake route between Ocean View Station and Navy Base Gate 4, the Granby route segment on Eact Ocean View Avenue and Shore Drive from Ocean View Station to its terminal at the Amphibious Base (Gate 1), the 8-Little Creek Road and Tidewater Drive, and the 15-Crosstown on Little Creek Road between Tidewater Drive and its terminal at Hampton Boulevard. The 15-Crosstown would have a new terminus, extended six blocks north to First View Street and Maple Avenue. The new route would duplicate service of the 2-Naval Base Route on Hampton Boulevard between Little Creek Road and Taussig Boulevard. The new route is illustrated in Figure 1.

The above recommendation is considered a short-term implementation action, but the following route modifications are suggested as mid-term actions: First the 15-Crosstown north of Little Creek Road could be rerouted to better serve commuters' and shoppers' needs and/or be operated on a demand-scheduled basis.* This route could serve Woods Corner Shopping Center at Little Creek Road and Granby, Southern Shopping Center at Little Creek Road and Tidewater Drive, and the Ocean View commercial strip between Chesapeake Boulevard and Mason Creek Road. Second, new service, either demand-activated or demand-scheduled, could be instituted with the

*Demand-activated means to operate at the location and time requested--like a taxi. Demand-scheduled means to operate on a fixed-route, but only when requested.

area bordered by Little Creek, Shore Drive, Little Creek Road, and Buffalo Avenue. This neighborhood currently has no transit service, except for those living within walking distance of Little Creek Road, although at least 200 commuters to Sewells Point live there. If a trial demonstration or marketing survey shows that this service area does not support enough transit ridership to require one bus, then the area could be extended to include Larrymore Lawns, Saragota, Camellia Acres, and Heritage Point south of Little Creek Road.

If provision were made for efficient, frequent, direct (no-transfer) service to the bases, improved headways over the existing service (except for midday on the 15-Crosstown, which would receive service equivalent to what it has now), as well as circulation on both bases, Navy personnel in north Norfolk could be persuaded to take transit to work and also for other trips in lieu of using private automobiles. Personnel living South of Little Creek Road, but off the route of the 2-Naval Base bus, would be able to travel to either base with a single transfer from the 1-Granby, 3-Chesapeake, 15-Crosstown, the 16-Coronado at its new terminus extended approximately five blocks north to the vicinity of Tidewater Drive and Little Creek Road, or the 24-Tidewater Flier at Ocean View Station and at Little Creek Road. The 24, which operates only one bus southbound during the A.M. peak and one bus northbound in the afternoon, would be extended so as to be operated in the opposite ("reverse commute") direction to enable people to commute from downtown Norfolk to Sewells Point or Little Creek. Personnel living on the bases would be able to use the new Ocean View route to travel to a number of Norfolk destinations on a single bus, rather than having to start with the on-base service and change to one or two TMT buses.

Ridership on the proposed new route, as compared to that of existing lines before consolidation, is projected to be between 500 and 2,000 Navy commuters to Sewells Point and the Amphibious Base. Given the above level of ridership, the financial picture would be somewhere between breakeven and a $400,000 annual deficit. Table 4 presents detailed cost and demand data, using modal split estimates of from 5-20%.

Bus Rerouting in Portsmouth--If the CMB 4-Douglas Park-Cavalier Manor and 1-Prentis Park-Academy Park routes were combined, Shipyard workers in the Academy Park, Highland-Biltmore, and Loxley Place neighborhoods could commute to work without having to transfer; workers living in the Cavalier Manor and Victory Park neighborhoods would reduce transit travel time. This would be slightly cheaper to operate than the two existing routes, and it could attract approximately 100 additional riders. Table 5 represents the relevant details. Figure 2 illustrates the proposed route.

An express bus from the Greenwood Interchange Park-N-Ride lot to the Shipyard, operating during peak periods only, could carry as many as 260 round-trip riders. The subsidy is anticipated not to exceed $11,000 per year, depending on ridership and operational costs. Table 6 presents details to support the above calculations. An added incentive

Table 4

SEWELLS POINT-LITTLE CREEK CIRCULAR ROUTE:
PROJECTED RIDERSHIP AND COSTS

ROUTE: NOB Fleet Landing-Pier 12-Gate 2 Bellinger-Gate 4-1st Street Shore Drive-NAB-Little Creek Road-Hampton Boulevard-NOB.

	5%	10%	15%	20%
Ridership	574	1,148	1,722	2,296
Revenue	$402	$804	$1,206	$1,608
Cost	$1,552	$1,552	$1,552	$1,552
Net	($1,150)	($748)	($346)	($56)
Annual	($296,700)	($193,000)	($89,300)	($14,400 surplus)

BREAK-EVEN: 19.3% Ridership

Notes:

Bases for demand estimates

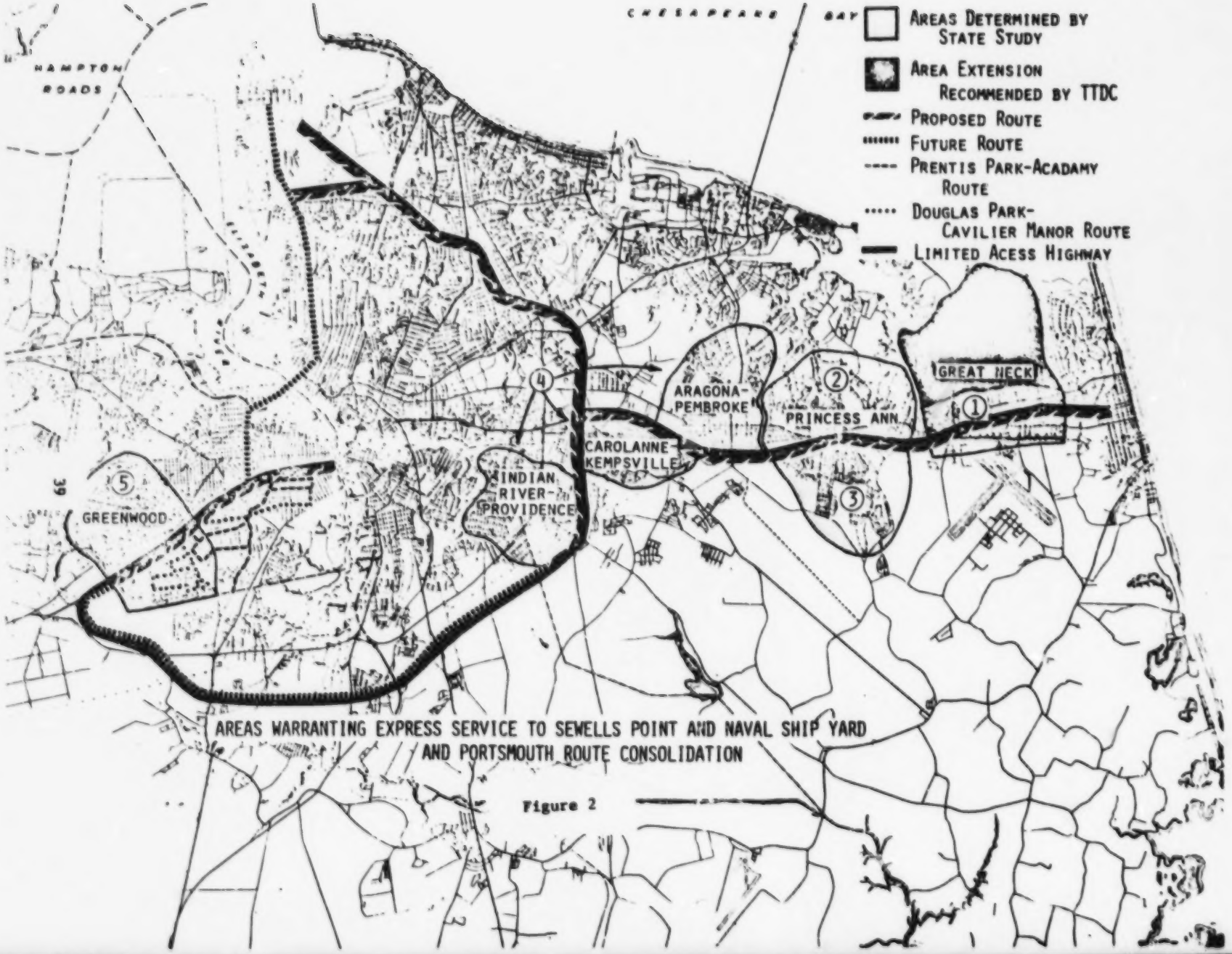
Navy Carpooling data, corrected for response rate. Transfers from current TMT lines included. 100-within walking distance. Contiguous TMT routes eliminated if possible.

Equipment requirements

11 buses during peak hours
3 buses at other times

Assumptions

35c fare, $13.50/hour bus costs, 258 workdays per year, 10-minute headways during the four peak hours, and every 30 minutes the rest of the day.



AREAS WARRANTING EXPRESS SERVICE TO SEWELLS POINT AND NAVAL SHIP YARD AND PORTSMOUTH ROUTE CONSOLIDATION

Figure 2

Table 5

PORTSMOUTH ROUTE CONSOLIDATION: POTENTIAL NAVY RIDERSHIP COST AND REVENUES

(Combine Cavalier Manor & Academy Park Routes)

ROUTE: Court & South, left on Effingham, right on Lincoln, left on Deep Creek, right on Elliot, left on Maurpin, right on Greenwood, left on Victory, same as Cavalier Manor line, back to Victory, right on McLean Transfer Circle, left on Elliot, left on Truxton, right on Portsmouth, Shipyard, Effingham, Court & South.

Current Bus Hours	
Academy Park	28.0
Cavalier Manor	68.3
Total	96.3
Consolidated, drop one Academy Park bus	14.0
Adjusted total	82.3
CMB $6.90 hour/bus costs	
Cost, at $6.90/hour = $568	
Daily Estimated Ridership (30¢ fare)	
Cavalier Manor	1430
Academy Park	384
Total	1814
Increase in Academy Park Navy ridership to Naval Shipyard (potential)	200
12% Modal split	25
Two-fold rider increase in Academy Park area runs	+100
Estimated total ridership	1943
Estimated revenue	$583
Daily Net	
Academy Park	$78
Consolidated	+$15
Cavalier Manor	$42
Annual	$3870

Source: Calculations from TIDC-CMB 1/1/75 data.

Table 6

RIDERSHIP AND COST PROJECTIONS FOR EXPRESS BUS SERVICE
BETWEEN GREENWOOD INTERCHANGE AND THE PORTSMOUTH NAVAL SHIPYARD

Projections	Model Split (0.45¢ fare) 5%	10%	15%	Champion Grid Number	Potential Riders
Daily patronage	87	174	260	49B	113
Daily trips requested	32	53	74	49D	139
				50A	333
				50B	225
Annual revenues	$20,200	$40,400	$60,400	37C	773
Costs	$31,000	$46,400	$61,900	49C	106
Deficits	$10,800	$ 6,000	$ 1,500	61A	17
				49A	118
				50C	178
Total					1302
Adjusted total*					1736

*Adjusted for 75% response by dividing by 0.75.

for the Park-N-Ride express service is that since the Shipyard begins work so early (7:20 a.m.), there would be maximum peak-hour equipment efficiency. Further use of the Park-N-Ride express service is proposed for commuters from Portsmouth to Sewells Point via the Midtown Tunnel. Demand for this service might be substantiated by marketing survey or a trial demonstration effort.

More Virginia Beach Express Bus Service--Additional Park-N-Ride express bus service can be operated from Virginia Beach to Sewells Point during the commute hours. The Virginia Highway and Transportation Department's Mass Transit Section previously identified four areas in Virginia Beach, and one in Portsmouth, from which express service could be operated to Sewells Point and to the Shipyard. The TTDC has also analyzed these areas and projected trip and bus mile requirements. The figures in Table 7 are an extension of those calculations and include projected ridership, costs, and revenue, and the service areas are illustrated in Figure 3. The costs were based on a minimum three-hour shift (at $13.50 per bus hour) divided by an average utilization factor of 1.4 trips per peak period, for a total of $30 per bus needed during each peak hour. A bus capacity of 40 was assumed, as were 258 working days per year. This conservative cost estimating procedure, combined with the use of a 10¢ premium over regular TMT fare for express service, results in between break-even or a modest profit and up to a $21,000 deficit per route, depending on load factors.

All of the express bus service should be flexible enough to be able to allow special catch-up buses for those who are delayed or have worked irregular hours. If a foreman anticipates having to keep his work force late on overtime, he could call the bus company several hours in advance so schedules can be modified.

Jitney or Minibus Service to Oceana and Dan Neck--These two bases have no public transit. A Jitney or minibus service is recommended to connect Oceana and Dam Neck activities with government housing at and near the bases, with the centers surrounding residential communities, and with Route 34--the Virginia Beach Local-Express at Virginia Beach Boulevard so as to provide transportation to Virginia Beach and Norfolk. The TTDC anticipates that later this year, limited stop service also will be operated on Route 34, primarily to connect Old Dominion University dormitories on the beach in Virginia Beach with the campus in Norfolk. Rather than terminating at Old Dominion University, the turn-around point could be located at Sewells Point. With the proposed jitney service, there would be direct service between the Oceana and Dam Neck residential communities and Sewells Point. Table 8 gives projected ridership, costs, and revenues for Oceana service. Figure 3 illustrates the proposed routes. The use of minibuses or jitneys on demand-activated service over long distances and low densities rather than the use of conventional equipment on fixed routes will no doubt mean a deficit operation. Table 9 presents the information for Dam Neck; in addition to commute service, the summer afternoon and evening service that has been included between

Table 7

ESTIMATED PATRONAGE, COSTS, AND REVENUE OF EXPRESS BUS SERVICES

Park-and-Ride Service Area	Fare	Ridership Potential Sectors	Ridership Potential Number	Mode Split	Expected Daily Patronage	Daily Trips Required	Number of Buses	Expected Annual Revenue	Expected Annual Cost	Expected Annual Profit or (Deficit)
Great Neck	85¢	47A	77	5%	59	2	2	$25,900	$31,000	($ 5,100)
		47B	32	10%	119	3	3	53,200	46,400	5,800
		47C	52	15%	178	5	5	78,100	77,400	700
		47D	45							
		48A	39							
		35C	65							
		34C	14							
		34D	68							
		48C	64							
		46B	117							
		46D	58							
		58B	14							
		60A	13							
			666-1189*							
Princess Anne	75¢	46A	71	5%	154	4	4	59,600	61,800	(2,300)
		46C	67	10%	308	8	8	119,200	123,800	(4,600)
		45A	176	15%	462	12	12	178,800	185,800	(7,000)
		45B	110							
		45C	234							
		45D	116							
		57A	311							
		57B	235							
		57C	64							
		57D	222							
		44D	119							
			1725-3080*							
Aragona-Pembroke	65¢	44A	383	5%	89	3	3	29,900	46,400	(16,500)
		44B	221	10%	178	5	5	59,700	77,400	(17,700)
		44C	349	15%	268	7	6	89,900	92,900	(3,000)
		44D	119							
		56B	47							
			999-1784*							
Carolanne-Kempsville	65¢	43C	204	5%	86	3	3	28,800	46,400	(17,600)
		43D	99	10%	171	5	4	57,400	61,900	(4,500)
		55A	159	15%	257	7	5	86,300	77,400	8,900
		55B	217							
		56A	125							
		55C	79							
		55D	77							
			960 - 1714*							
Indian River-Providence	55¢	54A	154	5%	88	3	3	25,000	46,400	(21,400)
		54B	142	10%	176	5	4	49,800	61,900	(12,000)
		54C	180	15%	265	7	5	75,300	77,400	(2,200)
		54D	170							
		53B	178							
		53D	194							
			988-1764*							

*When adjusted for 56% response rate.

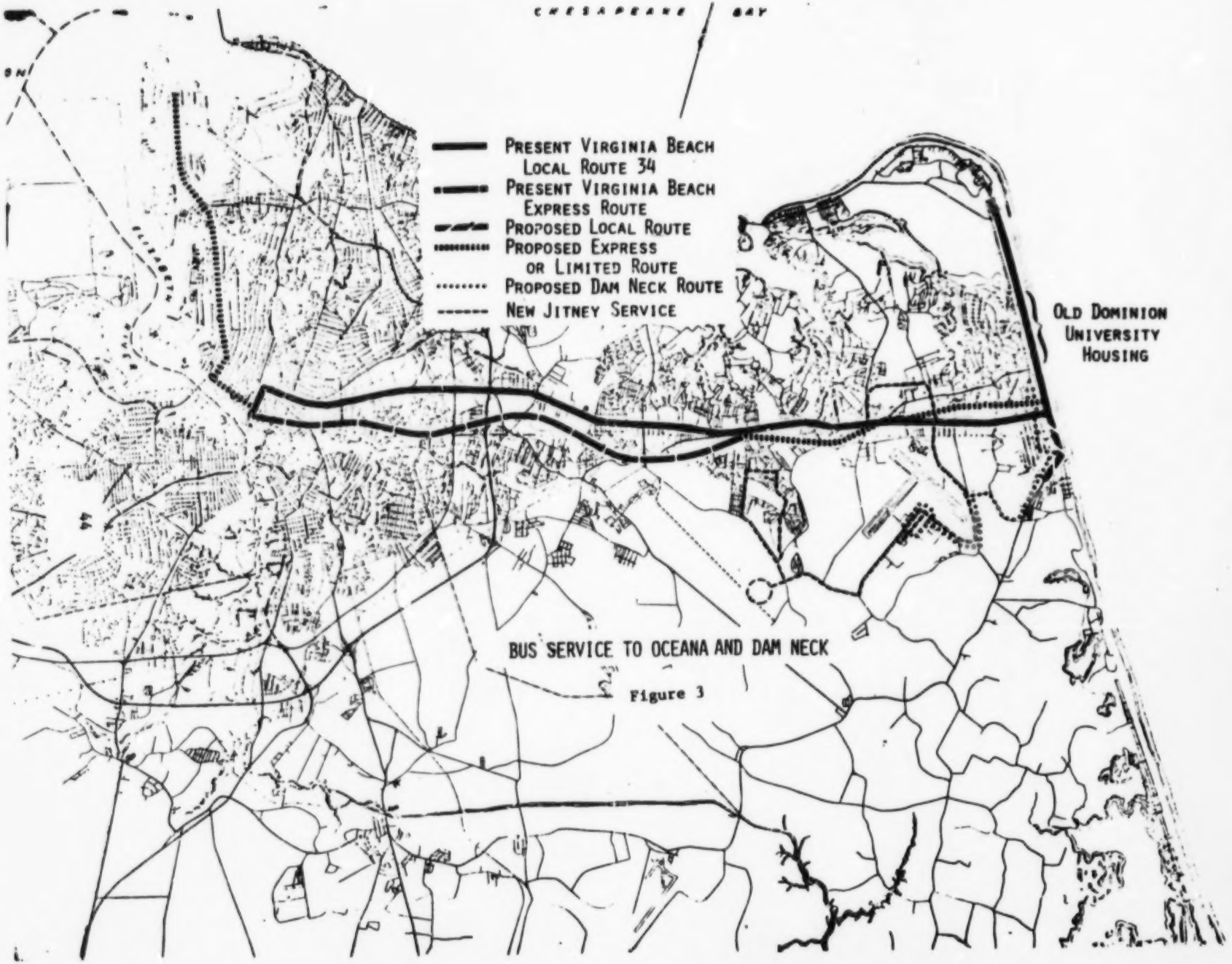

CHESAPEAKE BAY
PRESENT VIRGINIA BEACH LOCAL ROUTE 34
PRESENT VIRGINIA BEACH EXPRESS ROUTE
PROPOSED LOCAL ROUTE
PROPOSED EXPRESS OR LIMITED ROUTE
PROPOSED DAM NECK ROUTE
NEW JITNEY SERVICE
OLD DOMINION UNIVERSITY HOUSING
BUS SERVICE TO OCEANA AND DAM NECK

Figure 3

Table 8

RIDERSHIP, REVENUE, AND COST FOR OCEANA MINIBUS

ROUTE: Plantation-Great Neck-Wolfsnare-First Colonial-Princess Anne-Oceana-London Bridge-Ships Corners-Holland-Green Run Circle-Rosemont-Holland-Taft-Presidential-South-Rosemont-Club House-Lynn Haven-Holland-Ships Corners-London Bridge-Oceana

	Modal Split Estimates			
	5%	10%	15%	20%
Ridership	27	54	81	108
Revenue	$21.60	$43.20	$64.80	$86.40
Cost	$120.00	$120.00	$120.00	$120.00
Net	($98.40)	($76.80)	($55.20)	($33.60)
Annual net	($25,387)	($19,814)	($14,242)	($8,169)

BREAK-EVEN: 28% Ridership

Notes:

Bases for demand estimates

Navy survey (Carlson) data, corrected for response rate. 1000 within walking distance.

Assumptions

3 runs each peak period, 12 bus hours total, 40¢ fare, $10/hr bus cost, 258 workdays per year.

Table 9

DAM NECK SERVICE

Modal Split	Number of Riders	Revenue		Deficit or Subsidy/ Surplus	Cost
		Daily	Annual (258 work days)		
Peak-hour commute service* (Birdrock-Shadowlawn-Croatan-Dam Neck-Oceana)					
5 percent	18	$ 14.90†	$ 3,715	($19,505)	$ 90‡
10 percent	37	29.60†	5,337	(15,883)	23,220
15 percent	55	44.00†	11,352	(11,868)	23,220
20 percent	73	58.40†	15,067	(8,153)	23,220
Add 6 bus hours for summer run (1615)§					
2 percent	32	32.00*	30,420	(3,360)	7,200†‡
5 percent	81	81.00*	30,420	(2,520)	7,200†‡
8 percent	129	129.00*	30,420	(8,280)	7,200†‡
10 percent	162	162.00	30,420	(12,220)	7,200†
Combined commute and summer recreational annual budget					
5 + 2 percent			7,555	(22,865)	30,420
10 + 5 percent			17,057	(13,363)	30,420
15 + 8 percent			26,832	(3,588)	30,420
20 + 10 percent			34,507	(4,087)	30,420

*Need two buses at 20-minute peak-hour headways: one operational from 6:30-9:30 AM, one from 7:00-8:30 AM with equivalent service in the afternoon for a total of 9 hours daily.

Table 9 (Concluded)

[†]Daily revenue: 18 x 40¢ x 2.

[‡]Operation of 9 hours at $10/hour for small buses.

[§]For transients and students round trip to Virginia Beach.

[**]Daily revenue: x 50¢ x 2.

[††]Based on 120 days.

[‡‡]Costs per year x 120 days; May 15-September 15 = $7,200 for summer.

Dam Neck and Virginia Beach at a 50¢ fare should generate a small profit. Table 10 provides a listing of the recommended bus service additions, complete with a range of subsidies required.

2. Amenities

An attempt principally through the use of graphics and advertising--on the buses, on bus stop signs, maps and schedules, and media coverage--must be made to improve the amenities of the system. To achieve uniformity of on-base and off-base transit, the Navy should acquire bus shelters of the same design now used in Norfolk. Additional bus amenities that have been tried successfully in other areas include services such as newspaper distribution to riders, coffee, stereo music, and provision for card playing. These are particularly suitable to express buses. These actions are discussed in further detail in this report's major section on marketing.

3. Intensive Corridor Marketing

The routes identified above should be implemented sequentially, and the initiation of change in service should be launched by an intensive marketing program. This advertising campaign should focus on how the needs of community residents can be satisfied. A free-fare demonstration for a period of about one month could be included in this campaign.

4. Bus Incentives

Part of this intesnive marketing program can be the provision of incentives to induce transit ridership. One highly effective, but inexpensive, incentive is the use of drawings and lotteries. Each time a rider uses the transit, he can be given a free ticket for a chance to win a prize. Thus, the more one rides transit, the greater the chances of winning. Similarly, other promotions, such as entertainment tickets or restaurant tickets, could be passed out to transit riders. Finally, monthly passes should be made available. These could afford possibly a small savings, the convenience of not having to fumble for change, plus the chance to make payments monthly, as is done for automobile loans and gasoline purchases with credit cards.

C. Recommended Bus Actions: Midterm Options

Over the midterm period (1976-1978), four additional actions are recommended. They are as follows:

- A transit terminal should be constructed at Sewells Point. This could serve the private haulers, Navy buses, plus TMT buses, and taxis. Perhaps intercity bus routes could be

Table 10

SUMMARY OF PROPOSED ROUTES

Route	Projected Annual Operating Deficit
Consolidated Ocean View Route	$14,400 surplus to $296,700 deficit
Portsmouth Route Consolidation	$3,870 surplus
Greenwood Interchange to Shipyard	$1,500 to $10,800 deficit
Express Bus Service	
Great Neck	$5,800 surplus to $5,100 deficit
Princess Anne	$2,300 to $7,000 deficit
Aragona-Pembroke	$3,000 to $16,500 deficit
Carolanne-Kempsville	$8,800 surplus to $17,600 deficit
Indian River-Providence	$2,200 to $21,400 deficit
Oceana minibus	$8,200 to $25,400 deficit
Dam Neck	$4,100 surplus to $22,900 deficit
TOTAL	$6,000 to $420,000 deficit
Most Likely (10% Mode Split)	$260,000 deficit

modified to serve this terminal also, especially since sailors are traditionally frequent intercity bus riders.

- Higher capacity equipment (argiculated* or double decker) can be used for the express bus routes that show high ridership.

- A study should be made of the feasibility of implementing a transportation system across Hampton Roads to serve Navy personnel requirements. If it proved feasible, the Tidewater regional transit system could be extended to serve needs of peninsula travelers to Norfolk, Virginia Beach, and Portsmouth Naval installations.

- Public transit service should be further expanded.

D. Navy Buses: On-Base Circulation

1. Existing Situation

Sewells Point Naval Complex approximates a 3-mile square covering nine square miles of land. An on-base bus service currently is operated by the Public Works Center at Sewells Point, to the specification of and for payment by the Staff Civil Engineer's Office. Service currently consists of three buses serving three routes at thirty-minute headways. There is no extra peak-hour service. The buses serve the principal base housing, work and shopping areas. In 1951-52, four buses were in off-peak service, with nine during peak periods.

Although the bus operation is entitled to charge fares, service to date has always been free. Nonetheless, an estimated 75 percent of the base employees who live on the base choose to drive to work, and perhaps 95 percent of the shoppers drive to the base exchange to avoid carrying packages. The overhwleming majority of on-base work, shopping, and recreational trips are made by private automobiles.

The Little Creek Amphibious Base also has an on-base bus system, which is helpful because of the base's large area (approximately 2.75 miles long and 1.4 miles wide). The two on-base routes serve the east and west portions of the base, meeting at the Gymnasium. One route operates a sixty-minute headway, and the other bus runs every thirty minutes.

The two on-base bus routes at the Portsmouth Shipyard are operated under contract by Jim Smith, the low bidder. One route operates with two buses along the waterfront at 12-minute headways. They average 12 to 20 passengers, mostly blue collar workers, planners, and estimators. The

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*Two vehicles joined together.

other route carries primarily military personnel to dining facilities, although other passengers are allowed to us it. Because of the unsafe nature of the neighborhood surrounding the Shipyard, special nighttime service is operated to the Portsmouth USO and the Elizabeth River Bus Terminal.

Oceana has had a bus service since the last half of March. It operates a complete one-way trip around the base every thirty minutes from 7:40 A.M. to 3:30 P.M. Major traffic generators served are the Supply Center, Public Works, Aircraft Intermediate Maintenance Department, the Exchange, and the Commissary. Perhaps the lack of publicity accounts for the few riders. Hence, it is being advertised on the plan of the day, quarters briefing, and on bulletin boards. If an intensive advertising campaign fails to increase its use, however, the service will have to be discontinued.

There is no on-base bus service at Dam Neck. Nevertheless, a liberty bus operates from Dam Neck and Oceana to Virginia Beach on week nights until midnight.

The only other regularly scheduled Navy bus operates between Sewells Point and the Portsmouth Naval Hospital three times per day.

2. Recommended Action

Short-Term Options--Five steps are recommended for improvement of the on-base bus systems. Two of these involve scheduling. First, the headways should be improved at Sewells Point and at Little Creek, particularly during the hours of greatest on-base circulation. Fifteen-minute headways are recommended for the daytime; this is a short enough time to wait for a bus without having to memorize or refer to schedules. Fifteen-minute headways could substantially increase ridership. During morning and evening peak hours and at midday, service could be increased to provide 5- to 10-minute headways. Extra drivers for peak hours could be provided at only marginal cost because they can be used to drive other vehicles during off-peak hours. Thus, service could be provided at reasonable cost, and Navy personnel could be freed from having to drive a car to work just so they would have a means of transport at the base. This action could increase operating costs by more than $100,000 per year and thus might meet with some resistance. Some reliminary investigation has shown that money could be saved if service were contracted out. Alternatively if the Sewells Point-Little Creek circular route conslidation were implemented, then increased on-base bus circulation might be achieved by public buses. A small fare (10¢) could be charged for on-base travel in the public bus or official passes or tokens (similar to those used in Washington, D.C.) could be issued to Navy personnel.

The on-base bus schedules should be coordinated with connecting TMT buses to facilitate easy transfers with minimal waiting, particularly with the 3-Chesapeake-Mason Creek route at Sewells Point Gate 4 which

operates on a convenient modular schedule during the day. The Public Works Center's Operations Officer already has been provided with a copy of the Mason Creek schedule, and the proposed rescheduling was discussed with him on February 26th. The idea was endorsed and agreement as made to make the change.

The on-base bus service also should be more flexible to accommodate shifting demand, especially since a surplus of vehicles and drivers is usually available. Extra service or new routes should be put into effect whenever large ships or carriers are in port.

To save costs, an investigation should be made of the possibility of contracting out the on-base bus service at Sewells Point and Little Creek, as it is done now at the Shipyard. If this were done by private hauler bus company, using retired people or housewives as drivers, the savings could amount to $150,000 or more annually. Either the contractor or the government could provide the equipment.

Finally, an intensive marketing program should be launched for the on-base buses. This is especially important because of the high turnover at the bases. Transit, with good routing, scheduling, and equipment can be made as attractive as the automobile, and the transit habit must be cultivated in Navy people. The buses must be modernized, with better color, design, upholstery, and interiors. Some of the buses are scheduled to be repainted red, white, and blue for the bicentennial. This is a welcome change from their traditional grey. Modern plexiglass bus shelters already have been ordered for Sewells Point to match those of the community. Easy-to-read bus schedules and maps will be posted in them for both on-base and public transit, along with promotional material for transit.

Midterm Options: One to Three Years--Over the longer term, the Navy can purchase more energy efficient buses. Shuttle buses could be operated for a small fare from fringe parking lots, and double-decker or articulated buses could be tested.

Lead Agency:	Navy (Public Works Center)
Funding Agency:	Navy
Cost:	An additional $100,000/yr, unless contracted out
Timing:	Immediate--Midterm

V OTHER TRANSPORTATION

A. Over-the-Water Transportation

1. Introduction

> Eighty percent of the metropolitan areas in the United States are located near a body of water--an ocean, lake, river, estuary, sound, or bay. Some 90 million people live and work close to water. In view of these facts, it is not surprising that it appears feasible to expect that by 1980 one-half million urbanites in some 30 cities could utilize over-the-water craft daily as their primary mode of transportation. Such a turn of events would result in 200,000 fewer private cars in downtown business areas daily, 12,000 new jobs in manufacturing and operating the system, a higher quality of life for many city dwellers, and a number of secondary benefits not yet clearly perceived.[6]

2. Existing Situation

Until 1952, when service was terminated because new bridges and tunnels replaced it, ferry transportation was common in Tidewater. Today along the eastern shore of the Chesapeake Bay, only one ferry, a four-car "family"-owned ferry, crosses the Tred Avon River. In Tidewater, there is no intercity service on the waterways. A private water taxi, Shawn's Launch Service, serves almost exclusively the merchant ships docked in the middle of the Bay. Shawn's Launch Service has been in the water taxi business for 40 years and operates six boats: three passenger boats (one holding 42 passengers) and three freight boats. They operate from the pier of the old Chesapeake ferry and also at Newport News. The service is arranged through shipping agencies, and the fare is under two dollars per ride. Four of the vehicles operate at 10 to 13 knots and would require 35 to 40 minutes to go from downtown Norfolk to Sewells Point. The remaining two boats travel at 20 knots and would require 25 minutes for the same trip. Another company is negotiating to enter this business.

From May to September, Harbor Tours take visitors from Portsmouth and Norfolk for a tour of the Bay.

In 1973, the Hovermarine Corporation prepared and presented to the TTDC for consideration a route economic analysis for over-the-water

transportation as part of the region's transit program. The report attempted to show that hoverferry commuter and recreational operation is viable for the area because of an asserted 20 percent Return on Investment (ROI) attainable with it.

3. Recommended Action: Passenger Ferry Service

a. Benefits of Water Transportation

Water transportation, if proved economically feasible, could become an attractive alternative to the automobile. In Tidewater, such a service is envisioned as carrying only passengers, accommodating commuters between Norfolk (Downtown, Sewells Point)-Portsmouth-Craney Island, where 2,500 acres will be developed shortly as a free port; and Hampton, primarily during peak hours, as well as during the day for other travel needs. If passenger ferry service were established, it could eliminate the need for an additional Elizabeth River crossing.

During weekends, the service could be used for intercity travel, recreation, and tourism. Visitors could park their cars in Norfolk or Portsmouth and travel to Williamsburg or Jamestown. Coordination with available parking and feeder buses and taxis to the ferry landing would be essential, but apparently poses no insurmountable problems. The 300-space lot designed for Norfolk Gardens would be appropriate for a ferry terminal.

The commitment of funds to set up such a system and operate it for five years would be considerable. Consequently, SRI recommends a feasibility study to examine in depth the market for the service, the type of equipment needed,* routes and schedules, and the economic feasibility of a ferry service. A demonstration project of this magnitude should not be undertaken unless the anticipated operating costs are such that the communities can assume them when the grant expires.

The potential grantors for funding the feasibility study are UMTA, Department of the Interior, the Maritime Administration, FHWA, or the Bicentennial Commission. Ferry operation could come under highway jurisidction, or the Virginia Ports Authority, or TTDC and the Peninsula Transportation Commission.

Initial local expense would be limited to assisting the contractor in obtaining data. The feasibility study would address the extent of the local share after expiration of the demonstration grant.

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*The 196-passenger jetfoil craft should also be considered. Beginning this month, this service will be initiated in the Hawaiian Islands. The boats are 90 feet long, 31 feet abeam, and travel at 45 knots. They weigh 106 tons, cost approximately $3.5 million and are manufactured in Seattle, Washington, by the Boeing company.

A key aspect of implementation would be the integration of the system with feeder buses to major transportation terminals, hotels, and tourist attractions. To ensure positive public response, the new system should be introduced in stages, beginning with one or two routes and expanding service and adding new equipment gradually. Over the long term, as the system progresses, ferry terminals could function as mini-service and shopping centers.

b. Feasibility Study

A feasibility study is recommended. It should be prepared in two phases, and each phase should include at a minimum the following:

Phase I:

- An estimate of ferry patronage (surveys and interviews, origin-destination data, commuter growth characteristics, experience in other cities).*
- Selection of route priorities for commute and recreation and analysis of potential terminal locations.
- Recommendation of equipment (overview of over-the-water technology,* selection criteria: size, cost, speed, ride quality, fuel utilization).

Phase II:

- Initial capital costs.
- Operating costs (labor, insurance, administration, maintenance, fuel).
- Fares (break-even point, necessary subsidy).
- Detailed benefits and costs (to include cost versus building new crossing on Elizabeth River) and the nonquantifiable benefits, such amenity value and measurable benefits of energy savings and air quality.

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*The Golden Gate Bridge Highway & Transportation District purchased and refitted one ferry for roughly $750,000. It carries 575 passengers with a 7- to 8-person crew. The District estimates that only 20 percent of riders are commuters. The ferry is mostly used during off-peak hours and weekends for recreation.

On the basis of the research, the consultant should be able to suggest if a demonstration would be warranted for ascertaining whether Tidewater residents and visitors would enthusiastically accept and use a ferry service. The feasibility study also should address questions of operating agency and community financial participation and make recommendations regarding integration into the total multimodal transportation system for the region.

The Navy would cooperate by providing market support information and landings for the vehicles.

Lead Agency:	SVPDC, TTDC
Funding Agency:	Bicentennial Committee, DOT-UMTA, Department of Interior, Maritime Administration
Cost:	$50-$70,000, with region matching 10%
Timing:	Immediate

B. Bicycles and Motorcycles

1. Background

These two modes of transportation are energy efficient and do not contribute to base congestion. Motorcycles, however, are noisy. A problem is getting a sufficient number of employees or Naval personnel interested in using bicycles. Certain areas or streets could be designated for bicycle use, or paved bicycle lanes could be provided if demand were substantiated. Bicycle paths could be added to existing roadways at relatively low cost. Safety, however, must be a prime concern where the two modes mix.

Tidewater weather is unpredictable with relatively frequent precipitation and high wind speeds. Further, the distance between home and place of employment is often beyond typical bike distances. Consequently, a major effort toward moving commuters to bike use on a regional basis is not foreseen. Instead, on-base use of bikes is proposed.

2. Existing Situation

The Naval Shipyard (Portsmouth) owns approximately 1100 one-speed bicycles which are available to staff members who need them. All of the bicycles are painted white; some are assigned to a group, a shop, or directly to individuals.

A few bicycles and some motorcycles are seen at the other bases. Outside the 800-acre Shipyard facility, little has been done to

encourage or discourage this transportation mode. The Naval Air Station has recently completed a study and plans soon to implement bike paths. Sewells Point is about to begin studying potential bike routes.

Bicycles are an economical, energy efficient, nonpolluting mode of transportation and are generally acknowledged to promote and enhance the physical fitness of the user. For intrabase travel, particularly for those individuals who live on-base or on ships, bicycles seem to offer an attractive transportation alternative.

3. Recommended Action: Bicycles On-Base

In the initial action, the Navy should determine the feasibility of initiating bicycle allotment procedures at Sewells Point and other Naval stations similar to that of the Shipyard.

Steps to be initiated in two stages. The steps for the short term are as follows:

- Estimate the number of bicycles needed through the on-base user surveys described previously and input obtained from supervisors at the different commands.
- Identify the areas of likely greatest bicycle concentration.
- Determine whether bicycle paths, lowered speed limits, and/or street closings would be necessary.
- Design and delineate bicycle paths.
- Locate, purchase, and install bicycle racks (or change the location of any existing unused equipment).

The second-stage steps are:

- Establish an assignment or distribution mechanism with one person in charge of the program.
- Purchase bicycles and locks.
- Negotiate an open-ended maintenance contract.
- Provide the bicycles also on weekends for recreational purposes.

Further bicycle study for the Navy is recommended. The studies at Sewells Point should be continued and expanded to include the steps mentioned above. Priority should be given to Little Crrek in view of the recreational activities available there. As outlined above, the surveys

of on-base travel should be carried out first, with interviews conducted to estimate the need and acceptance of bikes before establishing a purchase-and-allotment program. The survey should give first priority to considering the needs of persons in the 1000 Navy housing units, in addition to Navy and civilian employees and visitors.

If the studies and survey warrant a decision to proceed with the purchase of bikes, the estimated capital costs of implementing the program would include:

	Cost
1000 bikes @ $30 per bike	$30,000
1000 racks @ $11 per bicycle rack	11,000
1000 locks @ $1.50 per lock	1,500
	$42,500

The estimated operational costs would include an administrative cost of one person day per week throughout the program and maintenance cost of an open-ended contract estimated at the rate of $2.00 per bicycle.

Lead Agency:	Navy
Funding Source:	Navy
Cost:	$45,000
Timing:	Immediate--Midterm

C. Pedestrians

1. Existing Situation

Navy complexes are ideally suited to promote pedestrian movement. However, this action is closely tied to land use. At the Sewells Point complex, more than 8,100 persons walk to their work stations; of these, 6,300 are living and working on ships. The 1,800 persons not assigned to ship walk from their places of residence to their work stations.[7]

The Naval Facilities Engineering Command intends to develop a regional master plan for the Navy bases in Tidewater. A project team has been selected and work will begin shortly.

2. Recommended Action

A recommendation is proposed as an element of the regional master plan that (1) areas of existing and potential pedestrian activity be

identified, and (2) possible pedestrian movement between work stations and the service facilities be incorporated as a criterion for location of new facilities and relocation of existing facilities. Over the long term, covered pedestrian walkways above major thoroughfares could be considered in addition to services such as transit terminals to encourage greater pedestrian movement.

The above is a Navy action independent of community endorsement or of federal funding.

Lead Agency:	Navy
Funding Source:	Navy
Cost:	$3,000 (1 man-month)
Timing:	Not a high priority, concurrent with NAVFAC study

D. Automated Guideway Transit Systems at Sewells Point

A study is recommended for the possible deployment of advanced transportation systems to achieve more fully energy-environmental objectives. The programs to be studied would fall in the midterm or longterm time frames and would require at least moderate capital investments. Cooperation with USDOT/UMTA would be desirable.

1. Existing Situation

Needs--The transportation needs of naval facilities such as Sewells Point have many characteristics in common with other major activity centers of urban areas, such as central business districts, airports, shopping centers, and industrial parks. Specifically, several relatively small areas within the facility have large populations of transient personnel, including those assigned to ships, military staff and workers, and visitors. To a large extent, the travel needs within a large naval facility can be grouped under three headings:

- External arrival and departure trips (parking lot to office, bus stop to ship).
- Circulation trips within activity centers (short trips along the waterfront).

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* Transportation Engineering Planning Study, Sewells Point Naval Complex, Norfolk, Virginia, August 1974, Military Traffic Management Command Report 24-26.

- Trips among activity centers (waterfront to commissary).

Costs--If cost were not a constraint, most of these travel needs could be satisfied by providing frequent transit services over a suitable network of routes. Also, such services could be beneficial, particularly by eliminating traffic and parking in congested areas. However, the automotive transit systems now used are labor-intensive and excessively costly for the high quality of service envisioned.

2. Advanced Transit Systems

Entirely new transportation systems developed in the past decade have been installed in 17 major activity centers, including seven airports, seven fairs and parks, two multipurpose commercial centers, and one university. Other systems are being developed and several dozen potential installations have been the subject of study. These systems are of two general types:

- Automated guideway transit using driverless vehicles and exclusive guideways.

- Moving way systems using conveyors or cable drivers.

Such systems undoubtedly could provide valuable services at Naval facilities. However, considerable work would have to be done to determine what systems are most suitable, how they can be used to best advantage, and whether or not their costs can be justified.

3. Recommended Action: Feasibility Study

A feasibility study of a program to install and demonstrate new transit systems at Sewells Point or another suitable site under Navy sponsorship is recommended. The study and program envisioned would seek cooperation from the UMTA, the U.S. DOT, and local transit agencies. Hardware considered should be characterized by low speed, low capacity, low cost, and short lead time. Examples of such systems in service are the Universal Mobility Minirail and the Rohr Monotrain. Other candidates are the Johns Hopkins University's Applied Physics Lab's ACT, Disney's Wedway, Aerobus, POMA 2000, and Goodyear Carveyor. The Johns Hopkins Applied Physics Laboratory's ACT is especially interesting since UMTA and the Navy might devise an effective and fast means to support necessary Research, Development, Test and Evaluation plus the capital costs to demonstrate in-service a nonproprietary system having a potential for Widespread urban as well as Navy use.

Many conditions at Sewells Point are favorable. Traffic congestion and parking pressures are severe; however, right-of-way acquisition is easily obtained, elevated structures are acceptable, and maintenance talent is available in abundance. System changes could be made by base personnel. The circulation network can interface with urban transit service plus remote parking.

Work could be undertaken in the three phases described below:

Phase I--The preliminary study and plan would include:

- Requirements analysis
- Definition of alternatives-hardware
- Network analysis
- Evaluation
- Review
- Adoption of objectives for next stage

Phase II--This phase would be for the preparation of a detailed plan covering:

- The design or selection of hardware
- Fabrication or purchase
- Construction and installation
- Testing
- Passenger service trials
- Operation and maintenance

Phase III--This phase would provide recommendations for implementation of the plan and preproposal preparation.

Lead Agency: Consultant

Funding Source: Interested Party
- Navy R&D
- Johns Hopkins University's Applied Physics Lab.
- UMTA R&D

Cost:	$60-$80,000
Navy Participation:	Provide study site, data
Timing:	Feasibility study, short- to mid-term, as interested sponsor emerges

VI NONTRANSIT ALTERNATIVES

The following nontransit options open to the Navy for reducing travel demands are discussed below.

A. Expanded Use of Staggered Working Hours and Monitoring of Flex-Time

1. Background

Staggered working hours can help to reduce the peak-hour congestion, with the greatest benefit being realized in the morning (0700 to 0800) peak period. Relief may not occur in the afternoon when automobiles on-base for other purposes will be at the exit gates. However, the effects of staggered working hours might be counterproductive to encouraging use of public transit because the private automobile will be more attractive once congestion is relieved. Staggered work hours also make a difficult scheduling problem for the private haulers, whereas, flex-time allows the employees to request a work schedule that enables them to carpool or buspool.* The Civil Service Commission has approved the concept of flexible working hours; several federal agencies including the FHA, EPA, FEA, and the Federal Maritime Administration, have started flexible hour employee programs. Flexible time (also known as flexed time or flexitime) means that an employee can arrive at work any time after a certain hour (six o'clock in most cases) and leave any time before 1800, as long as he works eight hours and is on the job during a core time period; for example, from 0930 to 1500 or split between 0900 to 1300 and 1300 to 1500.

In Tidewater, Navy civilian employees will have the option of working flexible hours. It is possible that, as a result, congestion will be relieved.

2. Existing Situation

Staggered working hours have been instituted at Dam Neck. The action has been able "to provide a fairly continuous flow of on-station traffic during peak periods," according to its 1968 preliminary master plan.

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*Staggered work hours differ from flex-time in that they are established by the employer; whereas, flex-time hours are requested by the worker.

The missions of each base are considerably different, so generally speaking, the commands will fall into one of these three categories:

- Work stations are totally interdependent and further staggering would be counterproductive.
- Staggering is occurring and further staggering is infeasible.
- Staggering is occurring and further staggering is feasible.

Shipyard: Portsmouth--The Shipyard is an example of the first case where work stations are interdependent and staggering would affect productivity. Further, staggered work hours would not be allowed under existing union contracts.

The first shift has 4500 and 5000 Shipyard employees working. A smaller number work the second shift, and 300-400 work the third shift. Possibly staggered working hours would be feasible in isolated instances but they could result in breaking up established car pools and discouraging bus riders.

Oceana Naval Air Station--The base covers about 5000 acres and has 8000 military people. Of these, 1000 are attached to the station, and 7000 are associated with flying units. Fifty to sixty percent of the time these 7000 will work regular hours (i.e., 0740-1600 or 0800-1630). In addition, Oceana employs about 1000 civilians. The 20 different commands operate relatively independently of one another. It appears that further staggering, which would avoid traffic congestion at the gate, could be feasible at Oceana.

Sewells Point Naval Complex--Major land-use changes are planned for within the Sewells Point Naval Complex and on its peripheral road network by 1979. Some exmples of these changes follow:

- An increase of on-base personnel (Table 11).
- Development by the Navy of the recently acquired property south of Admiral Taussig Boulevard.
- Additional piers to be constructed between Admiral Taussig Boulevard and the D&S piers.
- A dispensary and dental clinic.
- Naval exchange warehouse and air freight terminal.

Table 11

PROJECTED HOME-TO-WORK TRIP DEVELOPMENT BY WORK FORCE RESULTING FROM PERSONNEL CHANGES

Work Zone	Work Force (persons)			Driver Trips Generated		
	1973*	Projected Change†	1979	1973*	Projected Change‡	1979
1	19,167	-390	18,777	10,384	-300	10,084
2	3,866	-350	3,516	3,022	-269	2,753
3	1,998	+350	2,348	1,630	+269	1,899
4	5,005	-115	4,890	3,471	-89	3,382
5	201	+6,150	6,351	177	+3,624	3,801
6	46	+967	1,013	61	+744	805
7	7,040	+1,613	8,653	4,870	+1,022	5,892
8	2,711	-350	2,361	2,117	-269	1,848
9	395	-205	190	305	-158	147
10	330	0	330	327	0	327
11	2,491	-163	2,328	2,104	-125	1,979
12	139	0	139	77	0	77
13	124	0	124	109	0	109
14	448	0	448	352	0	352
15	413	0	413	152	0	152
16	4,066	0	4,066	3,210	0	3,210
17	41	+50	91	70	+38	108
18	615	0	615	292	0	292
19	280	+150	430	219	+115	334
Total	49,376	+7,707	57,083	32,949	+4,602	37,551

*Determined from origin and destination survey.

†Data supplied by Atlantic Division, Naval Facilities Engineering.

‡Determined by applying vehicle-per-person ratios derived from origin and destination to the projected change in work force. Factors were applied according to the type of personnel involved in each change.

- Expansion of ship support facilities in the D&S pier area.

- Relocation of the commissary.

After 1979, the following changes are planned:

- Relocation of Camp Elmore

- New buildings and roads at CINCLANTFLT

These changes will alter patterns and make increasing peak-hour demands at the gates (acute congestion could occur at Gate 2). It is recommended that the Navy give further consideration to the possibility of staggering work hours over a 2-1/2 to 3-hour period to eliminate peak-hour congestion.

At Sewells Point, some staggering already is occurring, but further staggering could be feasible. For example, work hours are staggered one-half hour between the following three major work stations.

	Base Location	Working Hours
NARF (Navy Air Rework Facility)	Eastern section	0645-0700 to 1515-1530
PWC (Public Work Center)	Northwest section	0730 to 1600
NSC (Naval Supply Center)	Northwest section	0800 to 1630

The morning peak period is considered to occur between 0630 and 0830 hours. However, the majority of personnel arrive between 0700 and 0800, with the highest number of people arriving at 0700 and 0730.

Departing times are staggered 1-1/2 hours from 1500 to 1630. Consequently, fewer employees leave at a specific time. Tables 12 and 13 show employee arrival and departure time by work zone.

3. Recommended Actions

An investigation regarding personnel and supervisory responses to flexed time and staggered work hours for possible peak-hour congestion effects (both in the AM and PM) at all bases is recommended. On the basis of this investigation, decisions could be made on further staggering or on establishing flexed time throughout the Navy facilities.

Table 12

EMPLOYEE REPORTING TIME BY WORK ZONE

Work Zone*	2400-0559	0600-0629	0630-0644	0645-0659	0700-0714	0715-0729	0730-0744	0745-0759	0800-0814	0815-0829	0830-0844	0845-0859	0900-1529	1530-2329	2330-2359	Total
01	286	795	182	433	5,310	1,564	6,007	1,190	3,069	41	40	3	97	143	7	19,167
02	16	48	54	24	351	641	902	935	461	16	81	47	128	145	17	3,866
03	10	24	62	750	65	273	197	24	273	69	10	0	17	205	23	1,998
04	131	45	55	361	2,206	73	1,066	139	388	12	37	10	62	343	77	5,005
05	2	0	0	0	51	9	84	15	20	0	0	4	14	0	0	201
06	0	1	0	0	0	5	13	1	22	0	0	0	4	0	0	46
07	60	171	65	84	1,637	961	1,925	2,151	322	13	8	4	17	17	4	7,040
08	4	72	44	648	370	148	374	250	371	72	151	49	78	76	4	2,711
09	7	10	34	87	85	6	49	13	38	11	15	10	18	9	3	398
10	3	17	4	26	110	83	37	21	34	0	21	0	0	4	0	330
11	34	19	6	26	430	110	548	254	898	6	11	0	11	132	6	2,491
12	0	12	0	0	39	32	25	0	15	0	0	0	0	0	0	139
13	0	0	0	6	102	2	13	0	1	0	0	0	0	0	0	124
14	33	5	0	5	51	9	35	71	217	7	3	0	0	12	0	448
15	0	4	12	10	27	33	83	94	141	4	0	0	0	0	0	413
16	48	162	137	154	358	486	669	733	1,163	41	23	4	21	64	3	4,066
17	0	0	0	4	0	0	17	0	4	0	9	2	4	1	0	41
18	0	20	6	1	7	18	148	99	291	9	2	9	5	0	0	615
19	3	0	1	2	10	24	34	1	196	1	3	0	4	1	0	280
Total	637	1,405	662	2,621	11,209	4,053	12,242	5,991	7,924	298	414	142	482	1,152	144	49,376

*See Appendix C for zone identification.

Source: Transportation Engineering Planning Study, Sewells Point Naval Complex, Norfolk, VA., August 1974.

Table 13

EMPLOYEE DEPARTING TIME BY WORK ZONE

Work Zone*	2400-0659	0700-1159	1200-1459	1500-1514	1515-1529	1530-1544	1545-1559	1600-1614	1615-1629	1630-1644	1645-1659	1700-1759	1800-2359	Total
01	148	337	277	4,031	2,674	3,317	309	3,072	1,496	2,715	89	392	328	19,167
02	92	45	69	119	39	359	599	965	820	388	43	239	89	3,866
03	195	25	54	55	730	291	27	460	34	51	4	24	48	1,998
04	323	89	142	157	355	1,987	93	959	32	908	46	183	131	5,005
05	0	0	9	11	16	34	9	83	12	14	0	12	1	201
06	0	0	0	0	4	0	3	18	1	18	0	2	0	46
07	8	43	77	615	196	1,461	577	2,736	119	228	68	780	132	7,040
08	22	22	55	146	777	422	29	199	225	527	34	111	142	2,711
09	16	30	23	31	91	47	2	46	20	49	1	10	29	395
10	3	9	7	39	30	94	24	32	13	52	3	7	17	330
11	81	66	21	17	87	498	78	870	87	372	25	232	55	2,491
12	0	0	13	24	1	13	40	37	0	9	2	0	0	139
13	0	2	0	61	15	31	1	14	0	0	0	0	0	124
14	47	10	3	0	3	53	4	55	31	209	12	16	5	448
15	8	0	0	0	0	14	0	20	32	298	32	5	4	413
16	88	46	99	165	21	141	278	552	227	1,630	146	480	193	4,066
17	0	0	0	0	0	0	0	16	0	7	2	16	0	41
18	8	0	27	2	0	8	13	452	17	37	6	35	10	615
19	1	5	1	4	0	23	5	55	4	177	1	4	0	280
Total	1,040	729	877	5,461	5,039	8,793	2,091	10,641	3,170	7,289	514	2,548	1,184	49,376

*See Appendix C for zone identification.

Source: Transportation Engineering Planning Study, Sewells Point Naval Complex, Norfolk, VA., August 1974.

Lead Agency:	Navy
Funding Agency:	Navy
Cost:	1 man-month
Timing:	After 6 months

B. Navy Family Housing

1. Background

Location of family housing for Navy personnel depends largely on available government land or of the cost of land for purchase. It is related also to local community acceptance, which occasionally perceives Navy family housing as having a negative impact on the local school district. Navy regulations stipulate that housing must not be situated farther than one-hour commute time from place of employment.

2. Existing Situation

Some family units are located on-base, but the majority generally are located within adjacent communities. The largest concentration of on-base family housing is at Little Creek with 1032 family units. At Sewells Point, only 140 of the 2127 units available are on-base.

Because on-base land has generally not been available and property adjacent to bases is costly, personnel in Navy housing often commute as much as 50 miles one way. Assignment procedure varies by command, but generally the applicant will sign his name on three lists of units within the one-hour commute time and will be allowed to reject two out of the three choices offered him as these become available. Size of family unit (bedroom entitlement) is determined by family size, family composition, and grade category. The number of men requesting to be located closer to their work station has increased in the past year. Also, some men are inquiring about transportation and transit options.

3. Recommended Actions

As an immediate action, car pool and transit information should be provided by the housing office; one-page flyers explaining commuting costs as distance increases should be prepared and made available to encourage persons to select housing units closer to their work stations. Over the midterm, Navy-wide housing criteria should move toward siting all new housing within one-half hour commute and near transit routes. As a long-range option, additional study is recommended on the potential significant benefits (such as increased energy savings) of increasing on-base family housing of higher densities.

Lead Agency:	Navy
Funding Source:	Navy
Cost:	Minimal
Timing:	Immediate--midterm

C. Hampton Roads Crossing Study

1. Existing Situation

The Hampton Roads Bridge Tunnel was opened to traffic in 1957 when it replaced the Newport News Ferry. The single bridge-tunnel toll crossing over Hampton Roads that joins the two Tidewater SMSAs (Newport News-Hampton, and Norfolk-Portsmouth) will soon be supplemented by a second parallel crossing. When the new link is completed, travel on both crossings will be toll-free. These two connectors should do much to integrate the economies and interests of the two areas.

2. Recommended Action

Lifting of the tolls should lead to new forms of regional interaction. A study to determine potential changes in commuting and recreation patterns is recommended. The study should include an assessment of land values, housing costs, and employment opportunities within the context of general economic prospects for each of the SMSAs.

Lead Agency:	SVPDC, Peninsula Planning Commission
Funding Source:	Above agencies
Cost:	$10,000
Timing:	Immediate

D. Transportation Information Centers

1. Existing Situation

Tidewater Metro Transit (TMT) in Norfolk combines marketing and information duties. Its transit marketing activities consist chiefly of media advertising and meetings with government representatives, citizens' groups, and civic leagues. There is also some effort to involve merchants in special promotional offers. Timetables have been published and display racks located throughout the community. A Metro Transit employee distributes these timetables.

Information regarding routes and schedules is given out over the telephone and occasionally mailed out. The TMT Marketing & Information Center staff consists of three full-time and one part-time personnel. The hours of operation are from 7:30 AM to 6:00 PM Monday through Friday and from 8:00 AM to 4:30 PM on Saturday. The Center's director has reported that the Center receives 2000 calls per week on the average.

2. Recommended Action

To realize the full benefit of the Navy-Community programs, it is recommended that a Transportation Information Center be established, incorporating information on all available modes of transportation for Navy travelers and for others. The Center is envisioned as a system of storage and dissemination of transit-related information such as schedules, costs, and routes regarding: public transit (buses), private haulers, vanpools, charter service, intercity carrier information, Navy bus service, and on-base taxi service.

In addition, the Center will supply telephone numbers to call for car pool information to be handled through individual Navy car pool organizers. Information will be provided initially to residents of the SVPDC service area. Eventually, it should include the Peninsula Transport District service area. Ideally, the letters "TRANSIT" could be dialed for information.

The hours of operation suggested are between 6:00 AM to 9:00 PM, seven days a week. During other hours, a tape recorder could record the caller's questions, and an operator could call back the following morning in response to less immediate requests. The Information Center will also receive and process complaints and encourage suggestions for improving service. The existence of TRANSIT would be advertised through the media, major employment centers, and shopping establishments throughout the community. Naturally, the Navy would play an important role in advertising this new service, particularly in the "Ship's plan for the day," for ships temporarily assigned to the base, in classroom orientation for students, and at the Navy Exchange, cafeterias, bus shelters, bulletin boards, and telephone booths.

Preliminary costs would depend largely on the ability of the existing facilities of the agency to assume this responsibility. Several agencies in the area have been identified as having the capability to incorporate this function into their ongoing activities. These agencies are:

- The Navy, through its Public Relations Office
- Hampton Roads Information Center
- Tidewater Metro Marketing.

Funding would be available from UMTA through the Technical Studies Program, Section 5 funds, or through reprogramming of federal and urban funds. Matching requirements, if any, would be prorated to cities on the basis of service provided. This action item is closely linked to two other action items: Transit Marketing and Navy Marketing.

A two-phase effort is recommended to implement the Transportation Information Center. Phase I consists of two tasks:

- Need determination
  - Estimate volume and length of calls (on the average 1-2 calls correspond to one hundred riders, but can be as much as 20 per 100 riders in the case of new systems).
  - Assess system requirements.
  - Determine which agency should operate service.
  - Select type of system--manual, computer retrieval,* microfiche (a study of costs demonstrates that microfiche is least expensive to operate).[9]
- Information and staffing
  - Gather and prepare data base to answer inquiries efficiently.
  - Build-in flexibility for expanding or updating system.
  - Initiate personnel training.

Phase I should take no more than 1 to 1.5 months, and the cost is primarily staff time estimated at 3 man-months or $3,750 ($1,250/man-month).

Phase II also consists of two tasks:

- Capital
  - Purchase equipment or adapt existing system.
  - Install recorder for evenings.
- Operational
  - Maintain system.
  - Advertise the service.

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*"Operator assisted computer retrieval systems solely for telephone information centers, while technically feasible, would not be cost-effective."[8] Conclusions from Point to Point Trip Management Program and Preliminary Analysis Report NBSIR 75-665, prepared for DOT, Special Projects Division, 2/11/75.

- Supervise closely and monitor calls to minimize "lost calls" (unsuccessful attempts to reach an operator), the need for new routes, and the optimum hours for service.
- Answer requests for mail schedules promptly.
- Follow up on complaints and assist customers with "Lost and found" items.

The system should be fully operational within 4 months of the Phase I is initiated. The preliminary estimated costs are broken down as follows:

Annual Operating Costs	
Director (1)	$15,000
Employed staff (4)	32,000
Volunteers (5-10)	--
Office/Supplies/Phone	7,200
	$54,200

One-Time Costs (Capital)	
Recorder (5 lines)	$ 8,000
Information retrieval system	5,000 - $25,000
	$13,000 - $33,000

Lead Agency:	TTDC
Funding Source:	Section 5 funds, SVPDC, Federal Urban Funds
Costs:	Phase I - $3,750 Phase II - $54,200 +
Timing:	Phase I - Immediate Phase II - Midterm
Navy Share:	Marketing and data collection

E. Transit Marketing

1. Existing Situation

Availability of information regarding routes, schedules, and fares will not by itself influence or change people's attitudes toward using transit: marketing, however, will contribute to changing attitudes. UMTA has defined marketing as "the development, operation, and communication of transit services consistent with recognized conditions and characteristics of the current and potential user markets in order to increase public awareness, acceptance and attractiveness of such services."[10] Marketing includes the functions of consumer research, transit service development, fare and schedule determination, user information dissemination, promotion, and monitoring/evaluation of marketing efforts.

To date, minimal effort has been made in the Tidewater area to market transit, and no effort has been made purposely to attract the more affluent rider. Like any consumer product, transit must be packaged and presented specifically to appeal to different types of people. In Tidewater, a transit marketing program should be established to operate on a continuous basis because of the highly transient Navy population. The principal objective will be to attempt to change the public's attitude toward transit. A major marketing effort is recommended contingent on the implementation of the recommended actions to start as soon as the new proposed routes are operational through the bases, the vanpool system is established, the private haulers organized, and the Navy bus schedules are coordinated with city buses. A strong initial effort should advertise the new area-wide system, and lower-keyed marketing and advertising should follow and continue throughout.

The Navy should assist in every way possible with the two components of this action. The Transit Information Center and marketing, however, are envisioned primarily as community actions.

2. Recommended Actions

Starting immediately and continuing over the next five years, an aggressive marketing program is recommended in connunction with the establishment of a Transportation Information Center (see Section V-D-2). The specific marketing program should include, but not be limited to the actions described below.

Major Graphics Program--Undertake a major graphics improvement program that includes shelters, bus signs, schedules, transit maps, and advertising.

Intensified Corridor Marketing--Test the concept of an intensified marketing program for new series and routes. Such intensified marketing would include:

- Conduct attitudinal surveys in a selected market area.
- Offer free fares for one month to attract initial experience and patronage for new bus service or route.
- Identify and appoint a "community transit coordinator" who functions as the key link between transit management and the potential patronage for the market area served. This concept has been successfully applied in Knoxville, Tennessee.[11]
- Develop a monthly bus pass system and discounts based on load factors.
- Provide various incentives, such as promotion offers, tokens worth discounts at the Navy Commissary.
- Design a built-in evaluation process for each marketing effort attempted.

Expand Marketing Community-Wide--Expand the successful marketing concepts developed in the intensified marketing program community-wide.

Office of Transit Management Service--Use the services and programs of the Office of Transit Management (OTM) at UMTA. For example, in cooperation with the American Public Transit Association (APTA), a two-day conference was held June 9-10, 1975, for transit district representatives. A Transit Marketing Handbook will shortly be available (June 1975). OMT could potentially provide marketing technical assistance at no cost to the Tidewater area. Other possibilities include management training grants and funding of innovative marketing efforts.

Contract Market Consultant--Contract with a professional marketing agency to design and conduct attitudinal surveys and to package transit services accordingly.

Educational Program--Concurrently, prepare a half-hour educational program suitable for TV viewing. The Chambers of Commerce will distribute the film to civic clubs, employers, and high schools and colleges. The Navy would assist in the production and distribution of the film among its service clubs. The film's message would convey that transit is a desirable economic and convenient alternative to the automobile. It would feature a 10-question, self-scoring test with true-false questions relating to energy conservation, hidden costs of owning an automobile, and knowledge of available options. Afterwards, the answers would be given along with hard facts and statistics. Additional educational programs, including driver education classes in high school, should be developed and promoted.

Market Coordinator--Employ a full-time marketing coordinator to design, administer, monitor, and coordinate the above transit marketing efforts. Clearly, an effective marketing program requires full-time professional effort and cannot be operated successfully on a part-time basis.

3. Implementation

The head agency for the transit marketing program should be the TTDC. Estimated costs for each action itme listed above are summarized below:

Recommended Action	Estimated Cost
Graphic improvement program	$20,000
Intensified corridor marketing (per corridor)	$10,000
Expand marketing community-wide	Not estimated
Use OTM services	No cost
Contract with market consultant	$15,000
Education program	$ 5,000
Market coordinator (per year)	$25,000

Lead Agency:	TTDC
Funding Source:	Participating jurisdictions and Navy share costs
Costs:	Full program - $75,000
Timing:	Immediate or as service is available

F. Navy Marketing

1. Existing Situation

Past research has shown that a significant market for transit exists and has also demonstrated the success of various marketing techniques. Yet the Navy lacks an explicit and comprehensive program for marketing transit. This is primarily attributable to inadequate joint planning between the Navy and current transit providers. As the relationships between the Navy and the community transit providers (primarily TTDC) evolve, however, the Navy clearly has a vital opportunity to ensure the success of improved service levels and programs. Without developing

these, the Navy may be in a position of service curtailed by unacceptable deficits that the outside community may be unwilling to finance.

2. Recommended Actions

All car pool, bus pool, express bus, and van pool programs recommended in the Action Plan require matching of common time-origin-destination needs as basic to designing effective pooling programs. A comprehensive marketing program, however, should also include: public information, incentives and promotions, and continuing service and responsiveness to employee needs.

a. Public Information

An effectively designed public relations campaign for Navy employees should be able to clearify the need and advantages of using transit. Important factors to stress in such a program are:

- Improved Travel Time--Improvement in travel time is important in commuter's choice of travel mode. Well-matched pools tailored to working hours can provide acceptable travel times. Pooling can reduce congestion during rush hours.

- Lower Travel Costs--With two to a car, an employee can save up to 50%. A vanpool of eight can reduce costs up to 80 to 90% over the single passenger automobile. Savings to an employee over the year can amount to $500-$1,000/year.

- More Convenient--Preferential parking and door-to-door service can be more convenient than the automobile by avoiding weather-related problems, providing service to the transit disadvantaged (handicapped, nonowners of automobiles), permitting use of the automobile for spouse, and thereby reducing the need for two-auto families.

- Energy Conservation--Transit provides a key opportunity to conserve fuel without restricting mobility. A single passenger auto achieves only 13 passenger miles per gallon compared to 100-passenger miles for a vanpool (10 passengers at 10 miles per gallon).

- Environmental Quality--Transit also reduces air pollution.

All these concepts must be marketed on the Navy bases in the Tidewater Area to the degree that, as one Navy official put it,

"Transit must be made as convenient as the automobile and the transit habit must be cultivated in Navy people."

b. Incentives and Promotions

In addition to public information, the use of special incentives and promotions where feasible is recommended. One method that has been effectively used is "coffee hours," which could be organized by the Navy Wives Association. Employees are briefed on transit objectives followed by question/answer sessions and distribution of ride-sharing lists. Such sessions permit potential riders to meet and make arrangements for pooling. Other possibilities include Officers Transit Day, promotional offers developed in conjunction with the Navy Commissary, and initiation of a monthly pass system. The Navy marketing support would be a critical component in ensuring the success of intensified marketing efforts in selected employee high-density zones in Tidewater.

The development of consumer-oriented transit services can be organized around joint Navy-commuter participation. The Navy marketing program, working through a selected number of commuter-elected transit coordinators, can help ensure the commitment and service improvements necessary to increase ridership.

c. Continuing Service

Effective marketing cannot be a one-shot effort; rather, it is extremely important that increased ridership is continued and expanded. The constant flow of new employees need to be brought into the transit habit. Time-origin-destination data need to be updated continuously, and promotions and incentives constantly developed, implemented, and evaluated.

Lead Agency:	Navy (Public Affairs Office)
Funding Source:	Navy
Cost:	$20,000/yr.
Timing:	Continuing

G. Navy Transportation Task/Function

1. Background

SRI has been impressed with what the Navy already has accomplished in Tidewater in addressing transportation and energy conservation-related issues. During the developmental stages of the Action Program, a considerable effort was required by both the SRI project team and Navy staff personnel to educate a broad segment of the outside community--city governments, transit districts, and other agencies--as to the particular

transportation needs of the Naval bases. Several Navy persons have played key roles in this effort, including the Commandant, Fifth Naval District, and his immediate staff. Because of this effort, a wide variety of innovative programs has been initiated.

A need remains, however, to build on this past experience by specifically delegating a task and function within the Fifth Naval District to carry out and fulfill the heightened expectations generated by the Action Plan process. Without this, the ad hoc nature of transportation planning and implementation in Tidewater could pose a serious constraint on effective Navy action in the future.

At the present time, there is no clearly defined focus within the organizational structure of Navy operations to address transportation activities specifically; rather, these activities are interrelated in a duplicative and confusing way among installations, planning, public works, and public affairs. No on-going mechanism is available to analyze and integrate Navy transportation needs with the community planning processes. (The recommendation made April 9 by the Continuing Transportation Study Technical Committee to include a Navy representative as a nonvoting member is an important step in this direction.) No effective coordination links the various commands, the Public Works Center, and the Commandant's Office to achieve large-scale improvements for on-base circulation, distribution, and marketing. The immediate staff of the Commandant's Office is burdened by a plethora of day-to-day details in providing transit information rather than being able to formulate longer-range policy development, implementation, and evaluation.

2. Recommended Action

It is recommended that the Navy undertake an in-house management study consolidate or define a focus for coordination for the full range of transportation activities to be carried out by the Fifth Naval District in the future. A better designed organizational structure and program accountability would strengthen the Navy's commitment to transportation improvements and energy conservation, provide a common location for establishing priorities and policies, and permit more effective intergovernmental and community liaisons.

The proposed task/function could:

- Place under a single officer the program resources and staff capability to improve performance in the Navy Area-Wide Transportation Action Program

- Administer transportation planning and implementation activities among various commands in a unified manner so that the separate programmatic orientation that exists might be coordinated and, thus, be made effective.

- Take prime responsibility for the continuing development of Navy-Community planning and implementation mechanisms and serve as day-to-day ongoing point of contact between the Navy and community for transportation issues.

- Develop short-range and long-range transportation improvement programs.

- Solicit input from Navy personnel--surveys, rap sessions--to identify transportation problems and issues and to devise solutions.

- Develop the Navy transit marketing function and provide support for a transit public affairs program.

- Establish and maintain a number of Navy transit commuter committees in various areas of Tidewater.

- Evaluate the effectiveness of alternative transportation energy conservation policies and programs.

Lead Agency:	Navy-Fifth Naval District
Funding Source:	Navy
Cost:	2 man-months ($10,000) for initial study
Timing:	Immediate

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